

through an impervious stratum of clay, and the water obtained is entirely distinct from the ground water of the locality. And in this way good water may be obtained where the surface conditions are very unfavorable. Again, the water obtained by sinking a well into a stratum of sand or gravel which has not been artificially disturbed is as a rule bright, clear, and free, or nearly so, from organic matter. Although originally coming from the atmosphere, in its slow passage into and through the ground the water has been subjected to a long process of sedimentation and filtration, combined with processes of oxidation; and in this sense the water may be said to have been purified by natural filtration. This process is not brought about by means taken to collect the water, but has been completed before the demand was made upon it.

My object in thus referring to the technicalities of water supply is that we may more clearly understand a description of local conditions, and I hope to be pardoned for having referred to it at extreme length. During the summer of 1892, Messrs. Armstrong & Cook decided that some method of water supply must be provided, and spent a great deal of time and money in determining how this could be brought about. In December of that year, or just six years ago, an experimental well was bored on a site chosen at random, and at a depth of 500 feet a quantity of water sufficient to supply the requirements of that time was obtained. After careful experimenting, a pumping plant was installed and distributing mains laid, and water turned on to the customers' houses on November 1st, 1893.

From the outset it was realized that the question of future extensions and enlargements both of supply and system must be considered, chiefly because the water bed was at such a low level that the cost of power for pumping was a serious drawback. During the year 1893, while constructing a sewer on Gazette ave., we came across a flow of water that gave us serious trouble owing to great volume of supply and sandy nature of subsoil. It was supposed that this flow would cease in course of time, but our anticipations were not realized, and from being a source of trouble primarily it became a source of great interest, particularly when it was seen that the water was of excellent quality and unremitting flow. Attention was soon attracted to the possibility of securing from this or surrounding points a secondary supply. This involved serious difficulties, owing to the nature of the subsoil in what was supposed to be water-bearing strata. During 1897 the idea forcibly presented itself that it would pay to investigate the whole strata to the surface of the rock or first layer of impervious stratum, with a view of arriving at actual conditions. Messrs. Armstrong & Cook saw at once the reasonableness of the suggestion, and agreed to employ an expert well borer, Mr. Wallace Bell, to do the work. As you all know, work was commenced quietly, but with determination to make it a success if possible. A type of drive well now generally adopted

was chosen, and after passing through an almost impervious bed of clay, 20 feet in thickness, water was found in abundance, but so inter-mixed with fine sand that it could not be used. It was decided, nevertheless, to try and find a gravel bed which was supposed to exist as water-bearing stratum at some point below. After passing through 35 feet of sand, gravel was found, and the success of the venture so far assured. The tube was driven 10 feet further, and on to face of an impervious stratum of hard pan. A pumping test was then made, which exceeded my most sanguine expectations, both as to quantity and quality. Two more tubes were sunk, and the combined wells to-day show a capacity of over 200,000 gallons in the 24 hours, without in any way affecting either level of water or flow from former exit. I have the strongest faith in the success of the present plant and its ability to furnish abundance of excellent water for years to come. While this is only an opinion, it is based on some knowledge of the whole subject and a fairly thorough and intimate acquaintance of the locality.

In conclusion, allow me to refer for a minute to the danger of contamination from surroundings. I refer to this because so many pessimistic views are held and the question is so often compounded. An analysis of the water shows it to be remarkably free from both organic matter and chlorine, the two great indicators of contamination by sewage and other objectionable matters. This water contains less than one-half of the organic matter contained in deep wells formerly in use, and at time of analysis less than one-tenth of the organic matter contained in the water supplied to the citizens of Montreal. So much for present conditions. What, then, of future contamination? I can only express an opinion upon the question so often asked regarding the sewer on Gazette ave., and say in reply, it is almost impossible for contamination to occur from this source; the hydrostatic pressure is in the opposite direction, and it is simply impossible for the weaker pressure to overcome the stronger, leaving the question of filtration out of the question.

Montreal West is to be congratulated on having such a supply, and I hope to see this source of supply developed as its importance and reliability demands.

Important as were the engineering difficulties to be overcome in the sinking of the wells, there yet remained the question

of providing a suitable pumping plant, which of necessity must be of such a nature and arrangement that cost of pumping must be reduced to a minimum, in order to place the waterworks system on a paying basis. Other conditions and requirements, such as the necessity of guarding against the erection of a building that would either offend the aesthetic taste of the adjoining property owners or be a nuisance by reason of the noise and smoke, were also to be met. After mature consideration, wind power was decided upon. It was felt that to be successful the question of capital investment must not enter too largely into consideration, and it was decided to get the best the market afforded. Inquiry showed a wide range of difference in opinion as to the likelihood of a wind engine plant being successful. It was felt, however, that if a plant could be secured with the three following conditions fulfilled, successful operation would be assured: 1st, operation without objectionable noises; 2nd, operation with very light breeze; 3rd, successful operation under high wind velocities.

The methods of governing and arrangement of parts of many windmills were found on examination to be such that either one or more of these conditions could not be complied with. Eventually, the present plant received my recommendation, and I am pleased to say has in practice quite come up to expectations and standard laid down. After having studied carefully the question and possibilities of wind engine service for small towns, I am strongly convinced that with proper care exercised in the choice of machinery, and conditions of service being such that this kind of motive power can be recommended for use, that the use of wind motors is to be recommended; in fact, I may go still further, and say that the possibilities of a service of this kind are but vaguely understood, and too much importance is attached by inexperienced men to what may be termed enforced hours of idleness due to lack of wind. With properly proportioned storage facilities, such plants as I have had the pleasure to lately erect will give the best service at lowest possible cost, by simply utilizing waste forces of nature's energy; and without wishing to appear egotistical, I say with pleasure that I am prouder of this my last piece of work in your town than of any of former efforts. I feel assured that the citizens of Montreal West will be equally proud when they realize fully what changed conditions mean to them and to the future success of their town.

Portland Cements...

HIGH GRADE GERMAN BRANDS FOR GRANOLITHIC AND ARTIFICIAL STONE SIDEWALKS.

Sewer Pipes, Best English Cements. Best Belgian Cements.
Culvert Pipes, &c. **W. McNALLY & CO., Montreal.**

BELLHOUSE, DILLON & CO., 30 St. Francois Xavier St., Montreal
Sole Agents for the Compagnie Generale des Asphaltes de France (Rock Asphalt).

PORTLAND CEMENT NORTH'S CONDOR

Paving and Fire Brick a Specialty

SITTING LION and WHITE CROSS Brand

NORTH'S "CONDOR" BRAND AWARDED FIRST PRIZE AND GOLD MEDAL AT THE ANTWERP EXHIBITION