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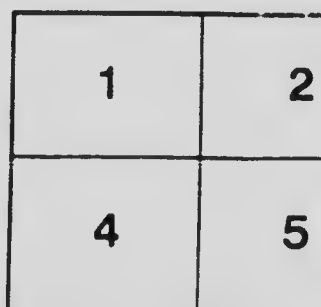
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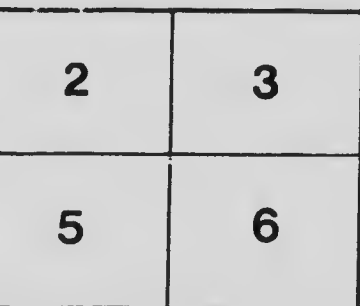
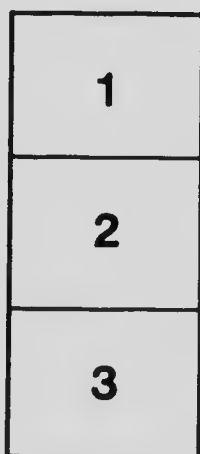
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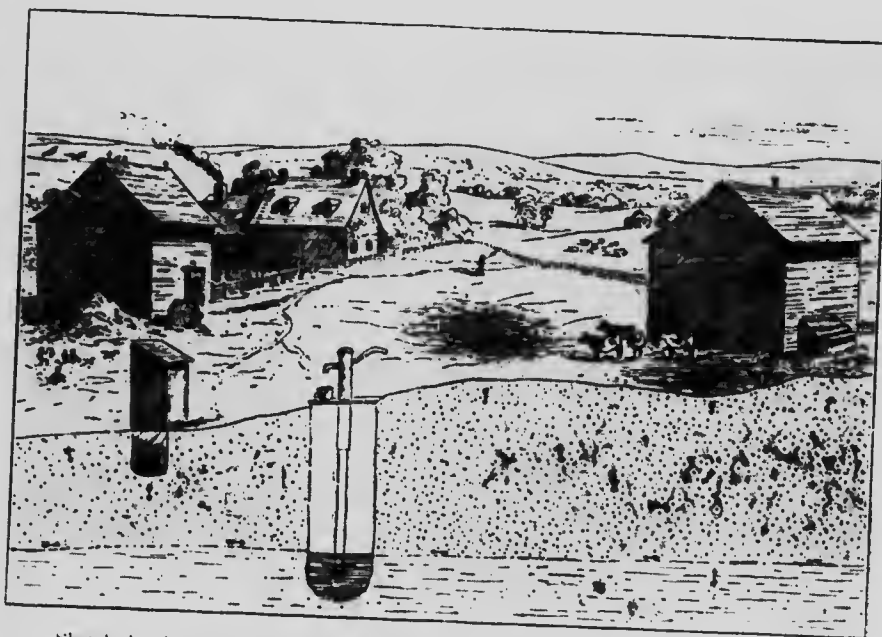
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THE FARM WELL

BY

FRANK T. SHUTT, M.A., D.Sc.

Relationship between health and the purity of the water supply.
The farm well should be deep, fed from an unpolluted source and located
beyond the possibility of local contamination.



Sketch showing how the barnyard well may become polluted by seepage from the barnyard, the manure pile and the privy. The arrows indicate the direction of the drainage, the well acting as a cesspit.

DOMINION EXPERIMENTAL FARMS.

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The Water Supply of Farm Homesteads.

Since the establishment of the Dominion Experimental Farms the question of the water supplies of farm homesteads, creameries and cheese factories, and, to a more limited degree, those of rural schools, has received the attention of the Division of Chemistry. Through the various means taken we are aware that an interest has been awakened in the rural water supply, and much good accomplished, but we also feel convinced that there is a necessity to continue the campaign for better water.

Impure Water a Menace to Health.

There ought to be little necessity nowadays to emphasize the vital importance of a pure water supply. The inhabitants of the larger towns and cities, thanks to the investigations of the chemist and bacteriologist and the publication of the statistics collected during the last three decades, are realizing the intimate relationship that exists between health and the quality or, more correctly speaking, the purity of the water supply. The fact that outbreaks of typhoid fever in our large centres have, in many instances, been indisputably traced back to a polluted water supply has served to win this general admission and facilitated the task, for the civic authorities of obtaining large sums of money to procure an ample supply of wholesome disease-germ-free water. In many rural districts, however, it has been found impossible, so far, to arouse the keen interest which the subject of pure water deserves. Farmers are very conservative and modern methods, especially when they entail considerable expenditure, or cause some inconvenience, may not readily be adopted by them. Farmers, as a class, are not yet fully alive to the value of unpolluted water for themselves and their families, for the health and thrift of their stock and the quality and wholesomeness of their dairy produce. Nor do they realize how easily and how frequently not only typhoid fever—the most serious of water-borne diseases—is contracted from the polluted well, but that diarrhoea and allied forms of intestinal derangement—common disorders in many a farmer's family—are the result of drinking water from contaminated sources.

The Natural Water Supply.

There is probably no better watered country in the world than Canada. We can unhesitatingly affirm that our natural waters of lakes, streams and springs are of the purest. Unless these are endangered by local sources of contamination they may be utilized to furnish the water for domestic purposes. Our deep-seated waters also are for the most part organically pure. It is to the deep drilled or bored well that the larger number of our farmers must look for their supply of good water. This class of well, located beyond the possibility of local contamination, is the solution of the problem for many. It is the well that experience has shown to yield the safest water.

The Shallow Well a Source of Danger.

The source of the supply on the larger number of farms is the shallow well, say from 5 to 30 feet deep, which merely collects "ground water," the soakage from the surrounding soil. Unless the location is beyond reproach from the sanitary standpoint, this shallow well is a menace—its waters may at any time become a source of danger. When, as is only too frequently the case, we find these wells sunk in the barnyard, or under the barn or stable, or not far from the privy (a most crude and unsanitary affair, as a rule), or near the back door, out of which the household slops

may be thrown and near which the garbage heap with all sorts of refuse may be found, then contamination of the water is inevitable and unavoidable. It is quite true that most soils, and more particularly those which are porous and well aerated (gravels and sands), possess filtering and purifying properties, but the soil surrounding the wells located as we have described, must in time become impregnated and clogged with organic filth of a most objectionable character. Such soil is then no longer able to purify the water passing through it, but rather serves to contaminate it more seriously.

Emphasizing what has already been referred to, we strongly advocate the bored or drilled well, tapping a deep-seated source. It cannot be stated that such a well will necessarily yield a good drinking water, but nevertheless it is the source of supply to be generally recommended for the isolated household. If there are no fissures in the overlying strata and there is no opportunity for water to flow downwards between the piping and the sides of the boring, a good water will in all probability be obtained.

Protective Measures which are Safeguards.

To those who, for one reason or another, must rely on the shallow well, we would say that the area around the well, say for a radius of at least 50 yards, be kept free from manure and all filth. It may preferably be kept in sod. Another precaution of considerable value towards the protection of the well-water from organic filth, is to line the well to a depth of say 10 to 12 feet and to a thickness of say 6 inches with concrete or puddled clay. This lining should project some 6 to 12 inches above the mouth of the well. This will prevent the direct inflow of wash and of water from the surface soil and will in all probability ensure a certain amount of filtration through clean layers of soil. It will also protect against the entrance of rats, mice, frogs, etc., which so frequently find a watery grave in the farm well. Both measures are to be recommended as safeguards, but they do not remove entirely the objection to shallow wells placed in proximity to sources of contamination. These precautions are frequently insufficient to prevent the infiltration of organic filth. Many suppose because the barnyard, back door wells never go dry that they have a spring, but such is not necessarily the case; undoubtedly the majority of such wells receive soakage and are supplied from the rain and snow falling on the immediate surroundings.

What Should be Done.

The shallow well should, if at all possible, be abandoned. Where there is no natural pure source, the water for domestic purposes should be obtained from a deep-driven or drilled well so located as to be beyond the possibility of local contamination. Experience has shewn that these are the wells that yield the safest waters. A careful survey of the farm should be made with the special object of locating the well, having in mind the practicability of piping the water to the house and buildings. However, convenience should not be a primary consideration; *the purity of the water is of the first importance.*

Further Safeguards.

If the water is offensive to sight, smell or taste, it is in all probability unsafe, or at least highly objectionable, for domestic use. In such cases boiling all the water required for drinking purposes is a great safeguard, for it will kill any disease germs that may be present, but it will not make the water a good one. Half a small teaspoonful of hypochlorite (chloride of lime), rubbed up with a little water and well stirred into a barrel of the water, is another precaution for the destruction of germ life, that is nowadays advocated. But a water impure from the presence of excretal matter is not to be recommended, even when one or other of these precautions is carefully carried out.

We must add one word of caution as to the judging of water by the farmer from its appearance, its temperature and its odour or absence of odour. Usually, if a water is not objectionable to sight and smell it is considered satisfactory. A water may be clear and sparkling, very cool and odourless and yet be most seriously polluted. Therefore, reliance should not be implicitly placed upon these characteristics, though they are those which all good waters should possess.

Saline or Alkali Waters.

The problem of finding an ample supply of pure wholesome water may be in certain parts of the three Northwestern provinces a difficult one, and recourse must frequently be had to distillation to obtain water free from alkaline or saline matter and fit for drinking purposes. Where such conditions prevail, we would recommend the purchase of a small still, which may be operated on the kitchen stove. Simply constructed water-stills suitable for this purpose, and with a capacity of about two quarts per hour, are to be found on the market.

Free Examination of Well-waters.

In the case of doubt as to the wholesomeness of the water the farmer should have a sample examined. Well-waters from farm homesteads are analyzed free of charge in the laboratories of the Experimental Farms, provided the samples are collected and shipped in accordance with instructions, which may be obtained on application from the Division of Chemistry, Central Experimental Farm, Ottawa, Ont.

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