

July 6th, 1910

THE GRAIN GROWERS' GUIDE

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resent the Grain Growers at Brandon on the 18th July to present their requests to the premier and other members of Dominion government."

"Resolved, that this meeting protest against the provincial government bringing on an election before September, 1911, or until we have had a chance to test the working of the government elevator bill, and that a copy of this resolution be sent to the executive and also to the government."

"Resolved, that E. Jones and J. Allen be appointed a committee to interview Mr. W. B. Waddell, M.P.P., re absence from meeting and that they report to all sub associations cause, etc., at once."

"Resolved, that the minutes of the meeting be sent to THE GRAIN GROWERS' GUIDE for publication."

"Resolved, that this meeting stand adjourned to be called by the chairman, Mr. John Allan, he to be guided by resolutions sent in by local branches, and all sub associations are hereby requested to submit subjects for discussion at said district convention, and that the secretaries of the sub associations be notified of the purpose of calling said district convention."

JOHN ALLEN, Chairman.
WILL CHANNON, Sec.

The Farm Water Supply in Minnesota

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the protection from surface wash and infiltration would make them safe. 25 were bad only because of poor surface protection and could easily be made safe. 1 was polluted from unknown, probably distant sources. One spring supply was polluted because of poor surface protection and could easily be made safe. The rivers, surface reservoirs and cisterns were all polluted, and it is doubtful whether satisfactory supplies can be secured for farm use from such sources. Where their use is necessary, water for drinking should be boiled or otherwise disinfected.

A further analysis of the published report of this investigation throws considerable light on the relative value of different kinds of wells. Out of the 28 common dug wells examined, only 3 were good; 16 were polluted but capable of improvement; and 9 were totally condemned. Of the 6 bored wells, 2 were probably good, while 4 were polluted with possibilities of improvement. The bored well is little better than to dug well, differing from it principally in size and containing a casing of wood, tile or tin. The bored well is subject to practically the same criticisms of construction as the dug well.

Of the 13 drilled wells examined, 3 were good, 7 were polluted owing to faulty construction or management, and 3 were condemned. Two of the condemned wells were polluted from indefinite underground sources and one from seepage down the outside of the casing. When properly constructed, the drilled well is probably the most satisfactory form to use, as the water is drawn from considerable depth in the rock strata, and an iron casing or pipe extends from the pump above the surface of the ground to the rock formation or to the bottom.

Of the 19 driven wells examined, 11 were good, 2 were polluted but capable of improvement, and 6 were condemned. The driven well is that type wherein the casing consists of sections of iron pipe screwed into couplings so as to be continuous and watertight throughout. The lower end of the pipe is armed with a sharp metallic point perforated with holes which penetrates the ground when driving and prevents the soil from entering the pipe. The driven well requires little care and is probably as safe as any type of moderately shallow supply, as the above figures show; but it does not touch these deep artesian streams from which usually the most desirable water is obtained.

According to the report of the State Board of Health, the actual proportion of polluted supplies in rural districts may at present be assumed to be about 35 per cent. Other investigations along this line prove this to be a moderate estimate. Prof. Frank T. Shutt, chief chemist of experimental farms in Can-

ada, has been analyzing farm water samples for a number of years. In 1906, a year of excessive drought, out of 90 waters analyzed, 28 were good and wholesome, 41 were suspicious and probably dangerous, 30 were contaminated and totally condemned, and 11 were saline. In 1908, out of 63 samples, 26 were good and wholesome, 18 were suspicious and probably dangerous, 12 were seriously polluted, and 9 were saline. In 1909, out of 96 samples, 26 were pure and wholesome, 52 were suspicious and probably dangerous, 26 were seriously polluted, and 12 were saline. In a letter to The Farmer, Prof. Shutt says: "Our work has shown that the shallow dug well in the barnyard or near the back door is the one most to be feared," and in his report of 1908: "The danger of the barnyard and back-door well has been repeatedly pointed out. The water in such wells is always liable to become polluted, if not with actual excrementitious matter, at least with its decomposition products, and in the majority of instances there can be no certainty that such has been thoroughly oxidized and rendered harmless," and again in his report of 1909: "The results of twenty years' investigation have shown unmistakably that it is quite exceptional to find a water from such a source free from pollution."

Another reply to The Farmer on this subject from Mr. W. D. Bigelow, acting chief of the Bureau of Chemistry, U. S. Department of Agriculture, says: "Generally speaking, water from drilled wells of considerable depth, which are amply protected from surface contamination, is much to be preferred over that from the ordinary dug well. The two serious disadvantages of dug wells are that they are usually shallow and therefore subject to contamination by surface pollution obtaining entrance into the underground supply, or the well is not sufficiently protected at the surface to prevent surface water gaining entrance from the top."

This, then, is the mass of evidence accumulated against the farm water supply as it too often exists. The ordinary shallow dug well is by far in most general use in Minnesota, and the figures, as well as the statements of the two government chemists, show that this type is the most susceptible to contamination. The cause is not far to seek. It has been found that bacteria are plentiful only near the surface of the soil; four or five feet down there are but few bacteria in the ground; and soil ten or twelve feet below the surface is perfectly sterile, unless it has within it a crevice or opening so that surface sewage can run down. The great majority of farm dooryards and barnyards are without any or, at least, adequate means of sewage disposal; all liquid refuse from the cesspool, etc., is permitted to permeate the surrounding soil; organic waste matter from the stable and outdoor closet leeches into the soil and is carried into solution or in precipitation to every surrounding point. The surface soil thus becomes filled with disease and poison producing bacteria. Consequently, a shallow well in which the water comes in contact with this polluted surface soil, or in which the surface washings can gain entrance, is the well that yields a contaminated water supply.

For these reasons the shallow dug well fails in its purpose. The area of the surface opening, usually with little protection, offers every inducement for the direct admittance of impure material from the surface and by the little openings in the ground permit it to penetrate downward and affect the underground supply. Unless carefully protected, all manner of creeping and crawling vermin, rats, mice and even the smaller domestic and wild animals, often find their graves in these unsanitary wells. This is evident when the periodic cleaning of the well takes place, which occurs only when the putrefaction and pollution have so far advanced as to be evident to the taste or smell.

It is possible, of course, to so locate and construct a dug well that it will be practically safe; but this necessitates ideal topographical conditions and continued care and attention. The main things are to locate the well on high ground, where the drainage is towards the buildings instead of from them; to construct and maintain a casing of stone,

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