well. Furthermore, care must be taken to have this also extend well above the surface of the ground. It is evident that little good will be accomplished by securing a safe supply of water from the rock if it is allowed to be contaminated from above.

STERILIZING IMPURE WATER.

Drinking water, contaminated in some one or more of the ways indicated above, has often been a source of the spread of typhoid fever. It may happen that the water of a well is under suspicion, or that it is known to contain the germs of typhoid fever, and that no other water is within reach. In such a case, a sure method of treating the water to destroy the germs, without rendering the water distasteful, would be of great value. During the last few years, bleaching powder has been used more or less to sterilize water during a typhoid outbreak, and quite recently further application of this method has been made for the continuous treatment of municipal water-supply in the United States, and, nearer home, in Toronto; and, wherever it has been properly used, it has not only destroyed typhoid and colon bacilli, but practically all bacteria in water, except a few spore-formers.

It is a valuable means of sterilizing water, because chloride of lime (bleaching powder) may be bought almost anywhere, is very cheap, and, in the infinitesimal quantity used, is not only absolutely harmless, but leaves no taste in the water, and with a few directions may be used by anyone to render an infected water safe for drinking purposes.

Dr. G. G. Nasmith, Director of Health Laboratories, of the City of Toronto, and Dr. R. R. Graham, have worked out a simple method, which can be used by miners, prospectors or campers in Northern Ontario, or elsewhere, to purify immediately and on the spot any water which may be dangerous. This method was published in the Journal of the Royal Army Medical Corps, July, 1911, and is as follows :

"1. Take a teaspoonful of chloride of lime, containing about one-third available chlorine, and remove the excess of powder by rolling a pencil or other round object along the top of the spoon, or by flattening it with a penknife blade, so that the excess will be squeezed off.

"2. Dissolve the teaspoonful of chloride of lime in a cupful of water, making sure that all lumps are thoroughly broken up, and to it, in any convenient receptacle, add three more cupfuls of water.

"3. Stir up the mixture, allow to stand for a few seconds in order to let any particles settle (this stock solution, if kept in a tightly-stoppered bottle, may be used for four or five days), and add one teaspoonful of this milky stock solution to two gallons of the water to be purified in a pail or other receptacle. Stir thoroughly, in order that the weak chlorine solution will come into contact with all of the bacteria, and allow to stand for ten minutes. This will give approximately one-half part of free chlorine to a million parts of water, and will effectually destroy all typhoid and colon bacilli, or other dysentery-producing bacilli in the water. The water will be without taste or odor, and the trace of free chlorine added rapidly disappears.

"The writers have followed this procedure repeatedly, using only the simple apparatus mentioned, consisting of a teaspoon, a cup and a two-gallon pail. The water in the pail has been inoculated with typhoid and colon bacilli, and examined before and after chlorination. The result was invariably the same, namely, that all typhoid and colon bacilli were destroyed."

This method is equally applicable to the sterilization of water drawn from a farm well, and it may also be used to sterilize wells which have been infected, provided, of course, that the source of the infection has been removed. It would obviously be futile to sterilize a well situated in a farmyard from which organic matter and bacteria are constantly draining into the well.

CALCULATING THE WATER IN A WELL.

The calculation of the amount of bleaching powder required to disinfect the water of a well is simple. Suppose the well is six feet in diameter, and the water four feet deep, the formula would be radius (half the diameter) squared x 22/7 x depth of the water=3 x 3 x 22/7 x 4 =113 cubic feet of water in the well. Or, a simpler formula is the diameter of the well square[d] x .7854 x depth of the water=6 x 6 x.7854 x 4=113 cubic feet of water in the well. One cubic foot contains 6.25 gallons of water, so that 113 x 6.25=about 700 gallons of water in the well.

One and one-half pounds of bleaching powder is sufficient for the treatment of 1,000,000 pounds, or 100,000 gallons of water. Therefore, if 100,000 gallons require 1.5 pounds of bleaching powder, 700 gallons will require 1.5 ÷ 100,000 x700 =.0105 pounds, or about one-sixth of an ounce of the bleaching powder will be required to purify the 700 gallons of water. After weighing out the bleaching powder, mix with a little water, dilute, and pour into the well, and thoroughly mix with the water. This may be done by taking a long pole and nailing a couple of strips of wood across one end, and plunging this up and down in the water. If the well is too deep for this method, a rope may be attached to the pole, and the whole weighted so that it will sink in the water.

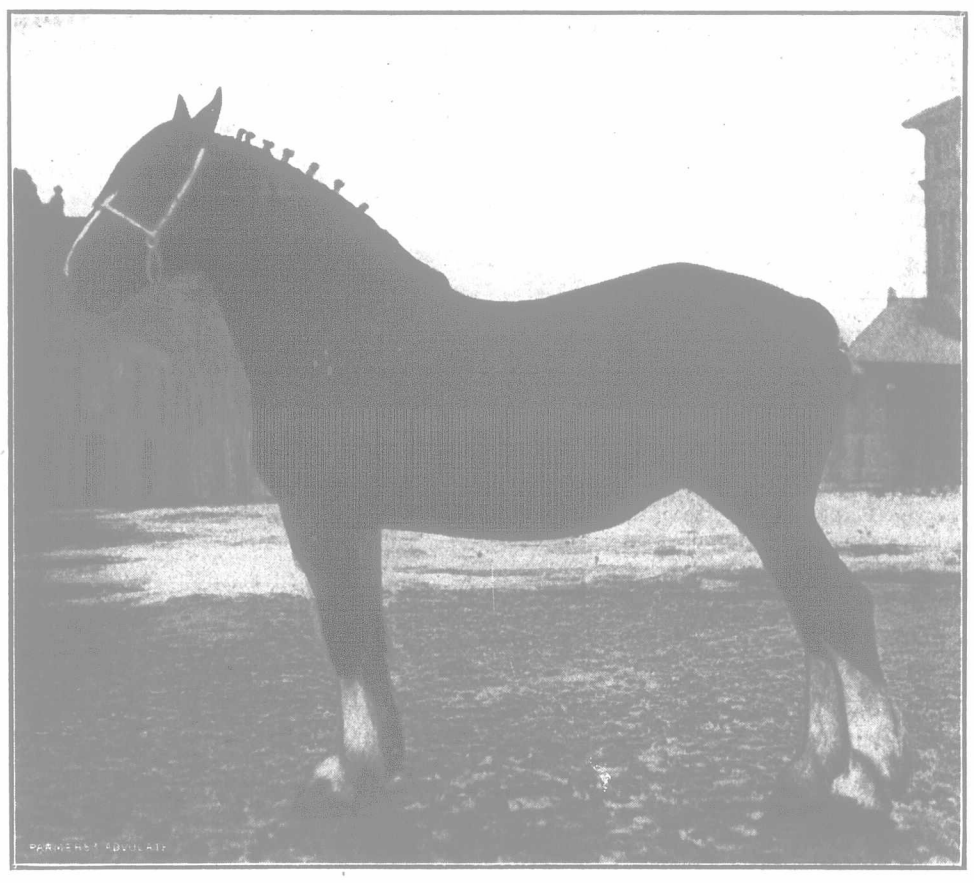
This method of treating an infected well has proved very satisfactory, and the amount of bleaching powder added is so small that it can scarcely be detected in the water. More than the indicated quantity is not required, and will do no good. It is important that the bleaching powder be fresh, and investigations by Nasmith and Graham show that the material in cardboard containers was not as strong as that put up in zinc packages. Naturally, if the powder is weak, more of it will be required to do the work.

It is our purpose to prepare a bulletin on the subject of farm well water, when we will be able to go more fully into the whole question.

R. HARCOURT,
O. A. C., Guelph. Professor of Chemistry.

Sowing Good Seed.

Satisfactory results in the operations of the farm are determined largely by the volume and quality of the field crops produced, and these depend primarily upon the quality of the seed sown. Public recognition of this condition has been tardy, when compared with the encouragement and direct public aid given the use of pure-bred animals in live-stock husbandry. However, in the Dominion Department of Agriculture, from small beginnings, the Seed Branch has made steady and substantial growth since 1904, and is now one of the most alive, practical and directly useful to Canadian agriculture of all the departments at the Capital. It grew out of a competition (Macdonald-Robertson) in the selection of seed grain in 1899, followed by the establishment of seed-testing stations, distribution of weed seed collections, seed fairs, Provincial seed exhibitions, field-crop competitions, and other educational work, which in 1904 acquired the standing of a regular branch of the Department of Agriculture. Contemporaneous with and closely related to the foregoing, was the growth of the Canadian Seed-growers' Association, to encourage the production of high-class seed grain, and its registration and sale. A seed laboratory for testing seeds for vitality and purity was established at Ottawa, and an investigation made into the seed trade, particularly in relation to the grass and clover seeds. As an outcome of the inquiry and the testing for farmers and merchants, it soon became apparent that legislation would be necessary to cope with the growth of the weed evil, and this took the form of the Seed Control Act of 1905, the standard and working of which have steadily improved. Capable and specially-trained men were appointed in the different Provinces who aid in the administration of the Act and share in the educational programme of the Branch, co-operating helpfully with Provincial agencies in that respect. Under the Act, farmers are exempt from the necessity of grading timothy, alsike, red clover and alfalfa seed, according to the standards fixed when the seed is grown, sold and delivered on their own premises; but they are not allowed to sell any of their seeds for seeding purposes that do not come up to No. 3 standard. Farmers are also exempt from the necessity of labelling seed with the names of the noxious weeds which it contains when grown, sold and delivered on their own premises. With these two exceptions, the Act applies to farmers throughout. When acting as agents selling seed not grown by themselves, or in selling their own seed on the market, or any place but their own premises, they are on the same basis as seedsmen. Through the co-operation of the leading wholesale merchants in the seed trade, the application of the Act has effected a wholesome improvement, the chief violations latterly being by local dealers in some districts. Unquestionably, the trade in seed and grain of low grade is being steadily cut down, and the demand for seed of high quality nearly everywhere is rapidly increasing. Encouragement has been given the production of Canadian-grown seeds, with fairly encouraging results; so much so, that the Dominion Canners' organization are now devoting the old Bow Park Farm of nearly 1,000 acres, near Brantford, Ont., to that purpose, for the patrons of the canning industry. In one year, with the assistance of the Seed Branch officers, the Dominion Government distributed to farmers in Alberta and Saskatchewan, whose crops had been seriously damaged by frosts, over 1,250,000 bushels of wheat, oats and barley for seed. In two editions, 40,000 copies of the volume entitled "Farm Weeds of Canada," illustrated in natural colors, were issued, and have proven of inestimable value in the campaign against weeds. A corresponding work on "The Grasses of Canada," is now in course of preparation.



Sally of Burnbrae (imp.) [13528].

Clydesdale mare; brown; foaled in 1904. First in open class, Ontario Winter Fair, Guelph, 1911. Exhibited by W. H. Mancell, Fletcher, Ont. Sire Montrave Ronald, dam by Invincible.

A great deal of the valuable work referred to in the foregoing does not lend itself to elaboration in annual documents, but the Seed Commissioner and chief officer of the Branch, Geo. H. Clark, is to be congratulated upon taking the time to prepare a 100-page report covering the period from 1905 to 1911—a model of conciseness, clear in its statements, and of actual use to farmers and seed dealers. It describes and illustrates the twenty-seven noxious weeds classed in the Seed Control Act Order-in-Council of 1911, and nearly seventy other species of weeds more or less injurious, against which farmers should be on the alert. The report is admirably printed, being readable in style and free from the prosiness of many official volumes. Its appearance is timely, just at the beginning of the New Year, and it should find its way into the hands of every farmer, young or old, in Canada. We presume a postcard to the Seed Commissioner, Ottawa, would secure a copy, and such requests should be promptly made. There is no excuse for being in the dark about good seed and weeds, when such a wealth of knowledge can be secured for one cent.

Don't Monkey With Lanterns.

Editor "The Farmer's Advocate":

We notice an article in your issue of Jan. 4th, on page 14, signed by W. J. Lycett, Durham Co., Ont., "To Prevent Lantern Glass Breaking." We quote from a portion of his article as follows: "By rimming out a row or two of the holes a little around the outside of the perforated base on which the globe rests, and also a row or two on top of the lantern just above the globe, it will allow greater circulation of air to pass through the globe, which will keep it from becoming too warm."

We would respectfully point out to your readers that these holes are made in the part men-