

below. In make benches anger of the f the workers is to keep and to throw t gravel met This is the the modern a the farmers of a man in or two men simply spoils To ensure el should be The circle a low grade ing the pit. to dig into gravel slumps

is the screen necessary; one screens can ng or orna ends on the ld be about ould be one d the gravel mounted on two support metal are ill not bend ge in price,

looks, but ed man will The screen is board built mply thrown the sloping n and is as it falls by y the shovel. vel should own against eer at least In fine sand will be y to use a iner than rter inch. ng fly-wire the screen p, although and is more n plastering concrete.

el may be e of three screen, pea, it-run, or n, named in commercial Pit-run is the gravel from the t. out screen- ad is not gravel taken part of the hich there if of coarse It, there- s pea and reen gravel and is quite e jobs, such y, free from ot suit- n getting to see that d that soil ember that il, once in, ly the best applies to icles in it, ough so as and is not an five per vel and the d the harder of smooth

l has been known as t twice as d a half a This gravel be arranged vel. The d, because he less soil y screen- it is much a pump for wet in the moved until

dry. It is of utmost importance to have this gravel clean. It is very important to have all gravel quite dry before attempting to screen. Next to stone, screen-gravel is the most important aggregate for concrete, and is safe to use in all walls etc. if the sand is also good. It is harder to use than pit, but makes a better job.

The gravel left after the screen has been taken out is sometimes sold as pit-gravel, but usually it is screened again, and is sold as sand and as pea. Pea-gravel is simply small-screen. Anything that will go through a half-inch screen and will not go through a smaller one is pea-gravel. Often the farmer finds it better to use this with the screen and the same method and use applies to it as to the larger gravel, but its chief use is to make a top or to be put anywhere that screen gravel would be too coarse. Where a smooth top is not desired it is often better to simply mix it with the other gravel. It is worth about one dollar seventy-five a load in the pit. Gravel is usually sold by one and one-half yard loads.

Sand is of the greatest importance. It should be screened several times to remove all foreign dirt. Good sand is "sharp" that is, gritty to the touch and is of a brownish color. Soil can be noticed by taking the sand in the fingers and rubbing briskly. The soft sand and dirt will rub to pieces, while the good sand will remain. Soft sand is recognized by its whitish color and by the fact that it becomes hotter in the sun, on account of its color and its greater packing power. In looking at good screen sand through a glass, it will be noticed that the grains are of an angular shape and that the different grains will appear to sparkle. It is impossible to work in poor sand and thus get a good finish. Money spent on good sand is saved on the cement. Shore sand is not, as a rule, suitable for concrete work, although there are places where the shore sand is suitable if screened. Pea-stone and stone-dust are also in the aggregate class, but are too expensive for ordinary use and are not always easy to get. They are used in places where it is necessary to get a brilliant polish, such as in verandah posts.

Cinders are not used as much for an aggregate as formerly, but are satisfactory for certain classes of work, although they are not suitable for walls, because they break up in the concrete and will not stand weight. It is, however, of use in fireproofing work. It is not used to any extent on the farm. If used at all cinders should be black and free from ashes. Gas house cinders are the best, and are worth about fifty cents a load. In point of strength, cinder concrete is the least valuable of all.

Sandstone, slag-slate etc. are poor concrete aggregates. It is better to use limestone than any of these, although it is much better to use gravel than this. If it is possible to get it, quartz gravel is the best to be had.

There are many different brands of good cement on the market and the man using concrete for the first time is safe in taking any established brand, but the selection of the aggregate depends mainly on the farmer himself. The material is often at hand but it must be prepared for use. Most of the failures in concrete work are caused by poor aggregates, and if the farmer would succeed in concrete work he must use care in their selection.

CHAS. L. PITTS.

Free Drainage Surveys.

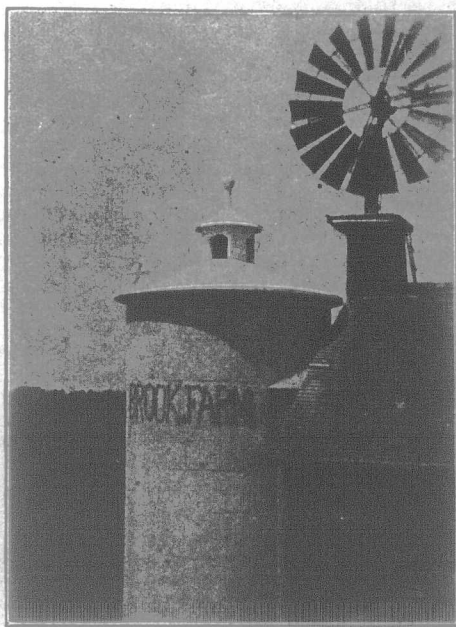
Have you a field on your place that is too "wet, cold and sour"? Drainage will reclaim it and make it one of the best fields on the farm. Drainage does four things. First it removes the surplus water and makes it possible to cultivate and seed about three weeks earlier in the spring than on the same land when undrained. Secondly it makes the land from ten to fifteen degrees warmer than if not drained, and this warmth germinates the seed properly and gives a good stand of grain. Thirdly, it lets plenty of air down to the roots of the plants, which is necessary for satisfactory growth. Fourthly, it makes the soil more porous, and this in turn causes the soil to store up more water for the use of the crops in time of drouth. Frequently the increase of crop in one year pays for the drainage, and seldom or never does it take longer than three years, so that drainage pays from 33 per cent. to 100 per cent. per annum on the money invested. Have you difficulties in drainage? The Department of Physics of the Ontario Agricultural College will assist you on application. They will make you a complete survey of the area to be drained, or run a single line of drain, and when done furnish you with a finished map showing location of drains, grades, sizes of tile, etc.—a detailed guide for the thorough drainage of the land in question. No charge is made for the services of the drainage advisers, nor for the maps, only the applicant pays the travelling ex-

penses in connection with his survey, amounting usually to not more than a couple of dollars. Drop a card to the Department of Physics, O.A.C. Guelph for the regular application form.

A Cement-Roofed Silo.

Editor "The Farmer's Advocate":

Having noticed considerable lately in your paper relating to silos and silo construction, I herewith send you a snapshot of one of our silos erected during the summer of 1912. It is built entirely of concrete, roof and all. We used the gravel from our own farm, building it ourselves, drawing the gravel as we used it, or at least not more than three or four loads at one single time. By so doing the gravel was always handy to the platform. We used wood forms that I had made five years ago in building a silo at another barn. The inside dimensions of this silo are 13 feet by 41 feet, the wall is six inches thick, plastered on the inside, and well whitewashed on outside with lime and cement. It is reinforced well with wire, the foundation (the vital part in all building) being well below



A Cement-roofed Silo.

Erected on Mr. Armstrong's farm at a cash outlay of \$140.

the frost line and free from water. The roof and cupola are well reinforced, and are constructed in such a manner that it is quite safe to walk around the lower edge to attach the pulley to draw up the blower pipe; pipe enters from roof. Regarding the cost, in the first place we are simply farmers not mechanics or builders, but I might say we have a "knack of doing things." Practically our only outlay was 40 barrels of cement at \$1.60, is \$64.00. Two young lads aged fourteen and eighteen years respectively and myself did the entire building, including hauling of gravel, construction of scaffold and completion of building, except outside white-washing (which I did last summer) in less than ten days at a cost of say \$70.00. I scaffolded on the inside and used a horse to draw up forms. The material used in scaffold was all old stuff and of not much value.

Labor	\$70
Cement	64
Incidentals	6

Total \$140
Perth Co., Ont. H. J. ARMSTRONG.

Rural Depopulation: Its Cause and Cure.

Editor "The Farmer's Advocate":

Much has been written recently about rural depopulation in Eastern Canada, and especially Ontario. In the last twenty years rural Ontario lost over one hundred thousand people, and many have naturally been enquiring the reason for this depopulation.

Many and varied are the reasons given, but it is only by a study of the fundamental causes that we can get the correct viewpoint. That there are fundamental causes there can be no doubt. For the fact is that rural depopulation is not confined to Eastern Canada, but is taking place in such diverse countries as Great Britain, France, Germany, Belgium,—thickly settled countries—and also in sparsely populated regions like the United States, Canada and Australia. Such a world-wide movement of population, must have tremendous forces back of it. The nature of these forces is not obscure, and can be determined readily enough by a study of our own conditions in Ontario.

We find in the Bureau of Industries report for 1911 a table giving the rural population in

Ontario for each year from 1872 to 1911. From that table we see that the year 1886 is the high-water mark for rural population in Ontario. Previous to that year it steadily increased, and from 1886 onwards it has declined.

What causes mark the year 1886 as the turning point in the tide of rural population in this province? Simply these two: First, the general adoption of labor-saving farm machinery about this time; and second, the completion of the Canadian Pacific Railway. The gang-plow, the horse-fork, the sulky-rake, and greatest of all, the self-binder came into general use at this time. True, the binder was used before this, but not until 1883 did the use of twine in place of wire begin. From about the same time also we date the adoption of the silo, cream-separator, hay-loader, potato-digger, manure-spreader and farm motor.

The introduction of labor-saving machinery caused great changes. To quote from the Bureau of Industries report for 1886: "The marvellously rapid development of machinery in agricultural operations in recent years has in part wrought a revolution in the matter of farm labor. Each of these reapers dispenses with the labor of four men, at what in former times was the season of the farmer's greatest need."

It was fortunate for the farm laborers who were displaced by the introduction of machinery that new fields of work were open to them on the plains of the Northwest. Instead of remaining at home in Ontario and attempting to secure employment by the hopeless method of underbidding machinery, the one-time laborers and their children are now using the same kind of machinery on their own Western farms.

Many of our farmers have gone westward also. But it is important to notice that they have gone chiefly from our smaller farms. In spite of depopulation the number of farm over 100 acres has steadily increased. The small farms show a large decrease. Under the farm machinery regime small farms became uneconomical. The amount of capital required for machinery, horses and buildings was too great for the amount of land worked, and the competition of cheap Western lands had to be met. So the small farm had to go, and will only return where the adoption of intensive cultivation makes it possible.

Women have left our rural districts in larger numbers than the men. In rural Ontario there are to-day eighty-six thousand fewer women than men. Our farm women have also been displaced by machinery. Dairying and other work formerly done by women on the farm is now done in factories.—But while men have had their labor lightened by new inventions the women have received as yet very little benefit from them. Scarcely two per cent. of Ontario farm homes are equipped with a piped water supply, one of the most necessary things for women's work. With such conditions of living, and wages for female help on the farm in 1885 at \$1.50 per week, is it any wonder that the girls began to leave for the town? To-day female help is practically unobtainable and male help of the right sort very scarce. They will remain so until present conditions of living are bettered.

The town dweller naturally saddles on the farmer the responsibility for the present high price of food. The truth of the matter is that the farmer is not responsible. For while rural population has decreased, the farm production of Ontario has increased. Since 1885 the value of live stock has doubled. The Bureau of Industries reports show large increases in numbers of all classes of live stock except sheep. It is true that in recent years the number of milch cows has decreased in response to high prices for beef, but that is owing to the culling out of the poorer cows. According to Mr. Ruddick, the total production of milk in Ontario has increased steadily. The average yield of grain is better now than thirty years ago. Fall wheat shows an increase of 3.7, spring wheat 2.2, barley 4.7, oats two bushels per acre.

The fact is that Ontario farmers have done remarkably well under the changed conditions. Supply and demand regulate prices. The supply is larger than formerly, as we have shown, but the demand has increased out of all proportion.

The reason for high prices lies in the tremendous urban growth which has taken place. Our immigration is largely responsible for it. Taking Canada as a whole, in the last census period we have added, chiefly by immigration nearly two millions to a population of five and a third millions. Of this two millions of an increase only thirty per cent. has been added to the rural population, while seventy per cent. has gone to swell urban growth. High prices for food naturally follow, and if the movement continues prices must go still higher.

Of course, high prices for farm products will induce a re-population of our rural districts. In fact such a movement has already started near our best Ontario markets. Economic forces brought about depopulation, and economic forces will now give back the people to a depleted countryside. The forces which have caused depopulation have apparently spent their force, and an increase in the rural population of Ontario