

deal for the farmers. Can they not still further help us along in the lines indicated above? The hog industry in very many parts of Ontario is a very great feature in the farm economy and helps very materially to swell the farmer's pocket-book, and we know that when the farm prospers business is rushing. JONAS.  
(Claver Ha Lea.

## FARM.

### The Drainage of Farm Lands.

(Concluded from last week.)

For instance, suppose that the sum of five hundred dollars is invested in laying a thorough system of drains under thirty acres of land. At that rate of cost land can be drained pretty thoroughly. Further, suppose that previous to draining the average yield of oats on that land has been thirty bushels per acre, which at forty cents a bushel would be twelve dollars; if the cost of working the land is placed at eight dollars per acre, the net profit amounts to four dollars per acre. Now, suppose that after the investment of five hundred dollars on this land the yield is increased to forty bushels, which is a conservative estimate, this yield at forty cents a bushel would mean sixteen dollars per acre, and with an allowance of eight dollars for cost of working, the net profit is eight dollars, giving an increased gain for thirty acres of one hundred and twenty dollars per year, which is just twenty-four per cent. of the original amount invested for drains, namely, five hundred dollars; or, to put it in another way, at the rate of one hundred and twenty dollars per year, the original capital outlay is returned in a little more than four years.

The wise farmer will sit down and count the cost in some such way as this before embarking upon the rather expensive undertaking of drainage. He will consider the circumstances in which drainage is likely to be needed. He may have on his farm a level tract of land, or land which is heavy and retentive of moisture; such soil would be sure to give good returns for the investment in draining. Or he may have a low tract which serves as a sort of sink for the overflow water or underflow water from surrounding higher land; such areas also stand badly in need of drainage.

For a healthful condition of things in the soil, frequent percolation of soil water is necessary, in order to carry off the soluble salts which otherwise would accumulate in excess in the soil. In arid countries, where the rainfall is so slight as never to produce underground drainage, and in swamps, where, on account of the ground structure, underground drainage is impossible, the same condition of things occurs, namely, the accumulation in excess of soluble salts in the soil. In the case of swamps, underdrainage is frequently the first remedy to be applied, and in arid lands irrigation with drainage is the most effective remedy for alkali. It is important that the farmer keep constantly in mind that the downward movement of water through the soil is essential to a proper degree of fertility, and to a proper physical condition in the soil; and where lands are highly retentive of moisture, or where, owing to the underground structure, natural drainage is difficult or impossible, then artificial drains become a necessity in every well-ordered farm.

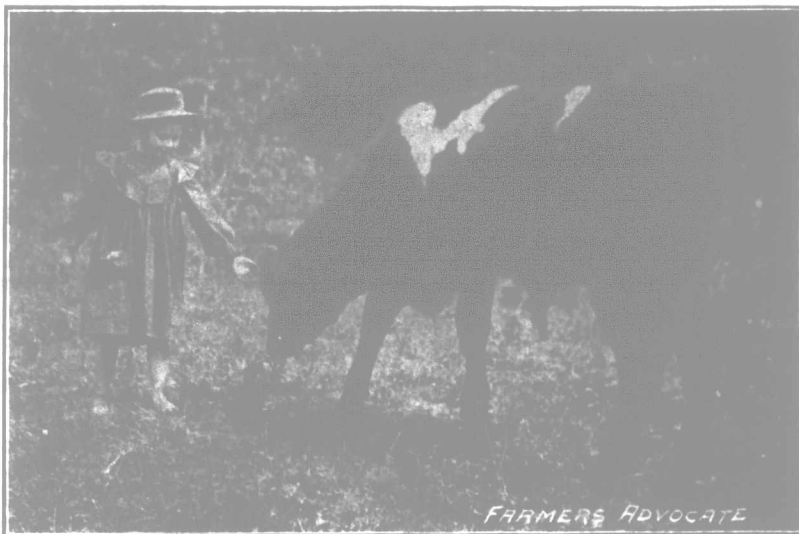
Next to the cost of drain the great obstacle before the practical farmer is what may be termed the engineering problem; that is, the question of preparing a working plan of drainage, locating the right position for the drains, deciding upon the depth, the amount of fall, the size of tile, and, last and most important, securing sufficient outlet. All of these present themselves at one time or another as practical engineering difficulties, with which the average farmer, on account of lack of experience, is unable to deal with any certainty of success.

Many cases that arise are easy to work out—such as a single main drain up through a low part of the field, or a small field of uniform easy slope. Here the eye may be a sufficient guide in determining the grades best for the drains. But where the field is uneven in surface, or where the slope is slight, much more care is necessary, and instruments should be used less liable than the eye to make mistakes. A small shack for a summer outing may be built without a prepared plan or without an architect, but if a fine house or barn is to be built a carefully-prepared plan is used as a guide in construction, and frequently an architect employed to make that plan. Similarly, for a small and easy system of drainage no plan may be necessary, but for a difficult or large undertaking, it is a matter of economy as well as of efficiency to prepare a plan very carefully, and in many instances to employ an experienced and competent person to do the engineering part of the work. This is especially true for drains, since any mistake or defect in the work is buried out of sight, and hence defects cannot be remedied without a plan of the work to guide in discovering the location of the drains.

In a drainage plan, the first consideration is the outlet. Here it must be said that no part of the drainage is more important than this. For however perfectly the drains may be laid, unless there is a proper outlet there can be no proper drainage. The outlet must be low enough and large enough. Second, the position, direction, depth and size of the mains must be considered; and, third, the laterals. To deal with those questions, the total area to be drained, the

character of the ground surface, whether rolling or level, and the character of the soil, are determining factors. For instance, the character of the soil to be drained has its influence both on the depth of the drains and their distance apart. In all soils, at any season of the year, there is a depth at which the ground is full of water—that is to say, in which the spaces among the soil grains are practically filled with water. The level at which this is found is called the ground water surface. Where land is drained this ground water does not present a level surface, but rather a rolling or sloping surface, something like a series of waves of water; the lowest parts of the surface being naturally over the drains, and the surfaces rising in a more or less gentle slope toward the center line midway between the drains. This slope or gradient of the ground water, it will be seen, carries the ground water at certain times of the year—as, for instance, in early spring or after heavy rains—very near or quite close to the ground surface. In close retentive soils the ground water gradient is steeper than in more open soils, hence in a close soil the drains require to be placed closer together than in more open soil, else the ground water will stand too near the ground surface at points midway between the drains, and will prevent the deep rooting of plants. In the preparation of a drainage plan, therefore, the character of the surface soil as well as the subsoil must be taken into consideration.

In the face of these difficulties, many farmers who decide to drain their land are at a loss to know how



A Little Bit of Suspicion.



Curiosity.

to proceed. To give this important work a start, the Department of Physics, at the Ontario Agricultural College, over which I have charge, invites correspondence with farmers. I am anxious to assist in the work of farm drainage in every possible way, and, with the approval of the Minister of Agriculture, I now announce that my department at the College will, for any considerable area, take the levels and prepare a working plan, provided the owner will defray the travelling expenses of the one person sent out to do the work. If such an offer be accepted, the work of making the survey may be made the occasion for a practical demonstration by the person sent out, upon the proper methods of draining land. Such a demonstration would fall under the same class as the travelling dairy or orchard meetings, and, at the same time, something definite would be accomplished in the survey of land. I should be very glad to correspond with farmers upon this proposition. J. B. REYNOLDS,  
Professor of Physics, O.A.C., Guelph, Ont.

FARMER'S ADVOCATE "WANT AND FOR SALE" ADS. BRING GOOD RESULTS. SEND IN YOUR ADVERTISEMENT AND YOU'LL SOON KNOW ALL ABOUT IT.

### He Blames the Farmers' Daughters.

To the Editor "Farmer's Advocate":

In response to your editorial in recent issue, soliciting a discussion on the subject, "Why Does Not the Farmer's Son Marry?" I would like to give my opinion. I heartily endorse what "Youthful Observer" says in the August 31st number. Now, I think a more important question is, "Why doesn't the young farmer marry?" I refer to young men who are farming for themselves, and are not confronted with many of the obstacles you mention. We know that there are a great many bachelor farmers, and that they are growing more numerous is an undeniable fact. The subject may seem of little importance to some, but in spite of this is one which should not be treated lightly.

There are quite a number of young unmarried farmers as well as older ones in this locality, and I have taken the trouble, or, rather, the liberty, of discussing the question with some of them, and will give the conclusions, along with some of my own observations. I think you will agree with me in saying that there are very few young men who conscientiously prefer to farm without a wife, or as "Jonas" calls it, "saving wood with a hammer," but on the contrary would have given up the single life of blessedness if they could have found a suitable life partner. Of course when they become accustomed to the happy-go-lucky free and easy life they often prefer it to the more restrained married life. It is true young men in town are more inclined to rush into matrimony than is the country young man, who,

as a rule, is of a more independent nature, and takes things more seriously, and on this he is to be congratulated, as hasty marriages are not always synonymous with happy homes. On the other hand, that he remains single is to be regretted. And now comes the reasons for this state of affairs.

We all know that when young men start farming they are seldom overladen with this world's goods, and have to run things on an economical basis—at least for a number of years—having to deny themselves many luxuries, and in some cases necessities, which patience and perseverance will enable them to enjoy later on. Now, instead of getting a true helpmeet to help him build up a home and share his lot with them, he gets a housekeeper—generally some relative—and in some cases we find him paddling his canoe alone. Now, without beating behind the brush, I can say from observation that the farmers' daughters are in a large measure to blame for this state of affairs. I think if those farmers' daughters who, as you say, Mr. Editor, are growing old in their fathers' houses, were competent housekeepers, and were properly fitted to become mistresses of houses of their own, there would be fewer good unmarried men amongst us. As Mrs. Laws, in her address at the O. A. C. last winter, said, there were plenty of girls who could locate the Himalayas on the map but couldn't locate the knives and forks in the pantry.

"To spin and sew was once a girl's employment, But now to dress and have a beau is all a girl's enjoyment."

Some of the above-mentioned young farmers hesitate to marry these butterflies of fashion. I have seen gardens on farms where there were from two to six grown-up girls, that would be a disgrace to any old woman of sixty. These same girls couldn't bake anything that you could safely eat without fear of indigestion, and I have seen them reading novels while their aged mothers washed the dishes. You say what can they do? Oh! they can play the piano, and can promenade just lovely. Next comes the delicate girl. "You know I don't let Mary do much work about the house; she isn't at all strong." Of course she always happens to be quite well when there is a party anywhere within ten miles. I heard another mother say to a young man who had incidentally dropped in on an errand, "Oh! Mr. ———, did you know our Jennie won the prize at the card party at ——— on Tuesday evening," instead of saying, "Mr. ———, you just ought to see the lovely bread our Jennie can bake." Let me suggest right here, without decrying suitable recreations, that there is something more worthy of a girl's aspirations than the exclusive pursuit of such things. Again, some girls who have had the opportunity of getting more than an ordinary education, and have, perhaps, become school teachers, are, as "Youthful Observer" says, looking for the riders while the walkers go by; or, in other words, think they are