hopelessly in debt to the agents is a large one, and carries with it some very tragic stories.

A look at the affairs of the live-stock farmer gives a much brighter picture. I have gone over a dozen farms here which have been cropped these last sixty years, and they are steadily increasing in fertility. While chemicals will fail to produce good yellow turnips, cattle and clover will produce a crop of generally 600 and sometimes 1,000 bushels of turnips to the acre. Wheat ranges from 20 to 30 bushels per acre; barley, peas and oats, from 30 to 60 bushels. While Long Island tenants are being put off farms because they cannot pay their fertilizer bills, and have years of debt before them, the same class in Ontario are steadily becoming proprietors.

There are two substantial factors in favor of live-stock fertilizing. One is that the fertilizer-producer is a permanent, sure investment; and the other is that the fertilizer produced lasts more than one year. The chemical kind is principally useful for only one season. Another thing about the cattle means is that half of it—that by both pasturing and plowing down clover—can be applied even more cheaply than the chemical kind. A serious objection to the chemical farming is the lack of intelligence applied. Repeatedly have I seen a man drive to a field in the morning with a load of bags, distribute them along the end, begin to plow, and before night the crop was in—and this on land which the man had never seen or known of before; and in more than half such instances the crop did not pay the cost of the chemicals. How different this is from the intelligent manipulating of soil by the use of clover and manure. The chemical treatment of the soil is in line with the precarious dependence on specifics. The one who depends on patent medicines for health is on a doubtful path to health; so it is with tonics in animals' feed, and chemicals for soil fertility is pursuing a doubtful course. Even chemists themselves are not agreed about the truth of the theories advocated. The poverty of the land so treated, and of the farmers who use the chemicals, both prove that there is something very erroneous in such farming. Much more should be done in testing by experiment stations before any farmer can depend on this method. Three important results must be produced, yet, by chemicals as fertilizers, they must produce more permanent results, they must be lowered 60 per cent. in their present cost, and they must produce larger crops and vegetables of very much superior quality to what they have hitherto done.

The results in the use of chemicals on the land point to the inference that they are not plant food, but are instrumental, in some manner, in rendering the plant food in the soil more available. One of the most striking differences between the chemical farmer and the manure farmer is that the chemical man depends on chance, and few read or take an agricultural paper, while 90 per cent. of the live-stock men do take such a paper. I have been able to compare a Canadian paper with the Yankee ones, and I must say that Canada farmers are being as well informed as the Yankees are. I am still looking for a good chance to compare two Canadian papers, but, although I have visited about twenty farmers' homes, I have not seen any but the "Farmer's Advocate," and I have visited farmers in the vicinity of Brantford, Paris, Galt, Ayr, and in Oxford County nearly as far west as Woodstock. The conclusion to a publisher is that the "Farmer's Advocate" man must have been a hustler, or the "Farmer's Advocate" fills the bill so well that "no other need apply." If the "Farmer's Advocate" has been instrumental in producing the conditions which are here, it is entitled to its patronage. ARCHIBALD CUTHBERTSON.

Springfield, L. I.,

[Note.—The above contrast between the effects of a prolonged dependence on chemical fertilizers on the one hand, and live-stock manure and clover on the other, is not, we believe, overdrawn, and our correspondent's comparison of the effects of the two systems upon the husbandmen is borne out by not a few instances within our own knowledge. For the great majority of farmers, reliance upon purchased manures leads to shiftlessness and poverty. It may be just as well in passing to correct a possible misimpression some might gather from the above letter, that chemical fertilizers are mere stimulants. The standard brands of fertilizers are not stimulants in any sense of the word. They contain considerable quantities of the necessary elements of plant food, but they lack humus, so necessary to maintain the proper physical conditions of the soil, without which plant food is applied to little purpose. While we do not believe the general farmer requires to use much or any purchased fertilizer, still, if any is employed it should be as a supplement to and not as a substitute for farmyard manure. Depending on fertilizers without also furnishing humus in the form of manure or clover, or in some other way, is agricultural suicide.—Editor.]

Cement Silo Satisfactory.

To the Editor "The Farmer's Advocate":

You ask some questions about wooden and cement silos. Silos are gone well past the experimental stage, so that in any district where corn matures, no one who winter feeds cattle for either dairy or beefing purposes can most profitably do so without corn silage. I am fully convinced of this, not from observation alone, but from actual experience as well.

Nine years ago my first silo was built, a round stave one, 16 feet by 30 feet, at a cost of $80, for material which to-day could not be obtained for less than $120. For a few years nothing could keep ensilage better, and there was not a particle of waste, but the last two years staves have been decaying, and possibly another year will end its usefulness. Where gravel can be obtained, I would strongly recommend building cement silos. With the steel rings now in use, any one accustomed to cement work can erect them, and they keep silage satisfactorily. I have one 14 feet in diameter, 2½ feet below and 35 feet above ground. The wall is 18 in. thick to the surface of the ground, then beginning with 1 foot, it tapers to 8 inches at the top. To the inside was applied, with a brush, a coat of thin cement. This makes it air-tight, and while a coating applied with a trowel leaves a smooth surface, it requires a very much greater amount of material and labor. In the center of the bottom a hole was dug down to sand, and filled with stones. This carries away any excess of moisture in cases where the corn is put in wet or too green. The cost of building this silo was $5.00 for every foot in height, and I had to supply gravel on the ground, 2 horses and 2 men. This help, with three men supplied by the contractor, filled two rings, or five feet a day.

The chief advantages of a cement over a wooden silo are that it is practically everlasting, it won't collapse or blow down in dry weather, it is always ready for filling, and in the end it is the most economical to build.

Middlesex Co., Ont. ROBT. McEWEN.

Cement Silo Experience.

To the Editor "The Farmer's Advocate":

With regard to my experience with wooden and cement silos, cost of construction, etc., I must say it is a duty which I can most cheerfully perform. My first silo (a wooden one) was built in 1890. It was a square silo, with the corners cut off. It was indeed a most helpful asset to a heavily-stocked farm in the dry seasons we experienced in the past, when corn flourished and other things wilted. While my experience was most gratifying, yet there was always considerable waste and loss in the corners. It was also quite noticeable in a few years that a wooden structure for silage would not be lasting, and when I sold my old stock farm near New Dundee, in 1901, the inside lining was very badly decayed—so much so that it required remodelling. Having once experienced the benefits derived from the use of a silo, I felt that I could not well get along without one.

When I purchased my present farm there was no silo on it. I built one the first year, considering it one of the most important improvements required on a well-regulated stock farm. I had gathered considerable information of value in regard to the different constructions of silos, and I felt fully convinced that a round cement silo was the most satisfactory and lasting. I have now filled my silo for the fourth time; am more than pleased with the results, and have no regrets to offer. The chief things in the building of a silo are permanency and convenience; if located at the right place, the cement silo combines everything to be desired. "Neither moth nor rust will corrupt it." It is storm, fire, decay and vermin proof, and if properly constructed it will last almost an indefinite time. There is not a particle of waste anywhere, except, as in all silos, a little at the top, not the slightest along the sides; there being no corners, there is none there, and none at the doors if put in right. The main thing in building a cement silo is to have good material and a good foundation. The cost of construction will depend somewhat on on local conditions, such as convenience to good gravel, small stone, price of cement, etc., but in any case, will not be much higher than a good wooden silo, and there is no comparison in durability.

My silo is 11 feet in diameter (inside), by 30 feet high. The concrete is 12 inches thick at the bottom and 8 inches at the top, with the batter on the outside. The foundation or inside of the silo is 2½ feet lower than the basement of the barn and in the bank, which kept it low and very convenient for filling. We used first-class Portland cement, which we have mixed one part cement to ten parts good clean, gritty gravel. We put in a layer of concrete, and then followed with a layer of small field stone, being careful that the stone did not touch the sides, and leaving room between so as to bind it together. This was followed in alternate layers, till we reached the top. Every 2½ feet a ¼-inch iron rod was put in to prevent cracking. We used 28 barrels of cement in the 30-foot wall; about 33 barrels in all, including cement floor and plastered on the inside. It will generally take from 30 to 36 barrels for a silo the size of mine, unless small stone are used, which lessens the cement needed considerably. I used a Hodgert mixer and steel rings 2½ feet wide, which makes a very complete outfit, and you can build a silo any size, from 10 feet upwards. A person should never stop short of thirty feet high, rather go higher. I have put a wooden top on mine, 6 feet high, and a round roof, which makes it very neat and attractive. I would rather go higher with the cement and no wooden top. The cost of the concrete wall was $150, without top. It will take from six to seven days to put up a 30-foot silo. It requires four men for a gang; more can work at it, but you can build only 5 feet a day, unless in very exceptional weather; it must have time to set.

Nobody will ever make a mistake in building a cement silo, if properly constructed. Where cement silos have not given satisfaction it is not the fault of the silo, but the fault is in construction. A. C. HALLMAN.

Waterloo Co., Ont.

Cement Silo Construction.

An occasional contributor who has, by experience and observation during several years past, become very familiar with the subject of cement-concrete silos, believes that these are past the experimental stage, and constitute the proper solution of securing efficient and permanent structures for holding ensilage. He recommends using one part Portland cement to 12 of good sharp gravel, bedding in plenty of stones; using steel rings; size of silo varies according to capacity in tons wanted; walls 12 inches thick at bottom, 6 inches thick at top; with an 18-inch footing down to below frost; every 2½ feet bed in 5-16 round iron bars; five openings for taking out ensilage, 20x30 inches each, and 2½ feet apart; give a coat of pure cement whitewash inside or plaster, with a mixture of cement and sand, 1 to 2½ parts, respectively; roof flat, made of matched lumber in sections, so that it can be removed for filling; properly built it may be filled in ten days after construction; bottom should slope to center, where there is a hole made for drainage. The danger of running tile drains to silos is the risk of rats getting in, causing great waste.

Cement Silo Approved.

To the Editor "The Farmer's Advocate":

Replying to your letter of recent date, would say that on our farms we have displaced two wooden silos with cement, and we find the cement gives altogether better satisfaction, giving no trouble in shape of repairs. The ensilage is quite as good. The initial cost is more, but the cement being more durable, makes it cheaper in the long run. THE T. EATON CO., LTD.

Toronto, Ont.

Friend of the Power Windmill.

To the Editor "The Farmer's Advocate":

"The Farmer's Advocate" is the most useful and highly-prized agricultural paper in Canada. I have admired its editorials, and generally agree to the wise and wholesome counsel given to those propounding questions through its columns. Some time ago one asked advice as to what power you would recommend for general use on the farm. The answer given was, after summing up the evidence for and against, that, after all, the power windmill was the cheapest and most desirable for farm purposes, to which my own experience of three years heartily agrees. I am convinced that harnessing the wind which a wise Creator causes to pass over every farm in sufficient power and frequency to discharge every reasonable duty is not understood or appreciated as it should by the Canadian farmer.

Looking around for a substitute for the horse-power, I confess I did not meet with much success or encouragement to go in for wind power. All sorts of rumors were afloat, as to barns burned with heated machinery or wrecked with the windmill. I turned with fear from these dangerous powers and set my affection on the gasoline engine, but upon making careful investigation I concluded that for my purposes the gasoline engine was not what I wanted. To be brief, about three years ago I purchased a 13½-ft. power windmill, with grinder and pumping outfit, to which I have added cutting-box, circular saw, root pulper, etc., etc. To every attachment it has proved quite successful—many winds equalling a ten-horse power, and easily controlled. I have ground over 3,000 bushels of grain, cut feed for about 50 head of cattle and horses, pumped water from a well some distance from the barn into a tank in the basement, which can be utilized inside or out.

True, the wind does not always blow, and the