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MARCH 1st, 1899

.. THE ..  
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**Reports.**

**COMPETITION OF AGRICULTURAL MERIT.**

*Report of the Judges.*

To the Hon. the Commissioner of Agriculture,  
 Quebec.

SIR,

We, the undersigned, the judges of the provincial Competition of Agricultural Merit, have the honour to present to you our annual report.

Our tour of inspection through the fourth region, comprising the counties of Pontiac, Ottawa, Argensteuil Nord, L'Assomption, Montcalm, Joliette, Berthier, Maskinongé, St-Maurice, Trois-Rivières, and Champlain, was highly interesting.

The weather, throughout the whole of our tour, was charming.

Hilarity reigned over the entire population; the crops were abundant, and every one was actively occupied in getting them in.

We are delighted to be able to say with truth that much skill and intelligence were manifested in the work done. Agricultural information is widely spread, and has borne good fruit; and a system of cultivation suited to the seasons, the land, the markets, etc., is being carried out with much sagacity and foresight. There is, therefore, evidence of a considerable amount of progress, both intellectual and material.

Still, the greater the improvement in farming, the greater were the demands we made, and we may truly say here that the same prizes to-day require the manifestation of more excellence than they required formerly.

The scale of 100 marks, which serves as a basis

for our decisions, presupposes the existence of perfection somewhere ; but we have rather to act by comparison between the competitors, and to reward the most deserving rather highly.

The most desirable sign of progress would be, that every competitor should become as highly skilled as the best of the whole band.

#### *General observations.*

Before presenting a report applying specifically to individuals of the leading competitors, we beg to submit a few general remarks ; and first on

#### *The improvements of our roads.*

We were delighted to find in almost every quarter, the road-machine and its perfect work.

All opposition should lay down its arms before so great a result. Only conceive such a prospect as the enjoyment of fine, efficient roads in every part of the province !

What an important improvement, and to what an extent would our dairy-trade have felt it in the quality of its products, had serviceable roads prevented the disastrous competition of so many small factories ! We cannot therefore but praise all those who have earnestly devoted themselves to the improvement of our public highways.

#### *Farm-accounts.*

We regret to say that, as regards farm-accounts, very little improvement is visible this year over our last tour.

As the competition of agricultural merit ought to be a course of instruction to farmers in general, the proof of its value can have no better test than the daily account of the operations carried out on the farm.

Doubtless, it is possible for the competitor to succeed without a system of accounts kept in detail, but to the public, at whose expense the school, so to speak, is kept up, it must be interesting to be able to satisfy a legitimate curiosity.

We therefore beg respectfully to say that several well-disposed farmers have asked us if there are not forms of account, composed of simple and methodical questions, that demand nothing further than simple replies.

The whole would form a perfect compendium, and would give very lively satisfaction to all those who wish to ascertain the real advantages to be derived from the several branches of agriculture.

Moreover, we hope to see the primary schools well prepared from this point of view ; in a word,

we want to see the young farmer better taught, better armed for the combat of life, persuaded as we are that nothing but a high degree of intelligence can enable the agricultural class to carry its head as loftily as its grand mission entitles it to do.

The marks given for book-keeping are only assigned as a sort of encouragement ; for there was nothing uniform and perfect in those submitted to us.

#### *Agricultural Meetings.*

In accordance to our wish, we have, as far as circumstances permitted, held agricultural meetings ; and we gladly say that these familiar chats with the farmers are likely to do much good.

Many questions were asked, and it was pleasant to see how anxious people were for information. We should not have supposed so great a wish to gain an extended view of things existed ; and this must be reckoned as an incontestable advantage.

Among other matters, we treated the importance of improving the highways, and the duties of the municipalities as regards the destruction of

#### *Weeds.*

We are bound to emphasise the fact, that the greater number of municipalities are unpardonably negligent in this respect.

Weeds grow in lush abundance all along the roads, and nothing is done to hinder them from spreading their seeds over the whole country. We know that other provinces have taken severe measures to hinder this, and we cannot understand why certain people of our province think these measures absurd.

We therefore beg the Hon. the Commissioner of Agriculture to act vigorously for the suppression of this negligence ; for we are firmly persuaded that the state of things demands it.

The road-inspectors appointed by the municipal councils seem to utterly ignore this duty of theirs ; and many of them do not seem to know that they have had this duty assigned to them ! They act in a merely formal manner.

We also laid great stress on the importance of

#### *Good ploughing.*

Is it not singular that the proper way to plough is of all agricultural things the least understood and the least practised ?

Nevertheless, every farmer ploughs !

As we did last year, so we must once more draw

the attention of the Hon. the Commissioner to this point.

Ploughing matches, superintended by competent men, could be made of the greatest benefit to the people at large.

It is the most important of all farm-work.

#### *Agricultural Societies.*

As we said above, farming has been greatly improved; all that remains, then, is to bring it to perfection; and all would go on admirably well were every agricultural society to do its duty earnestly.

But, sad to say, many societies and clubs only exist for the purpose of absorbing the public money.

A programme of operations, that has never seen daylight, is reported to the Department of Agriculture, and the funds that were intended to promote the public prosperity is divided among the members with the greatest coolness.

These folk, too, are the first to make fun of the government for interesting itself in the prosperity of agriculture!

*(From the French, by the Editor).*

*(To be continued).*

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## Manures.

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### BARNYARD-MANURE.

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Professor Shutt, the Chemist attached to the Experiment-Farms, has had the kindness to forward us an early copy of his essay on the "Functions, Composition, Fermentation, Preservation, and Application of Barnyard-Manure." Before opening the pamphlet, we felt sure that it would contain—as all Mr. Shutt's essays do contain—many hints of great practical value to the farmer, and we were not disappointed.

The first part of the brochure is devoted to general considerations connected with the main subject; soil-fertility, light and air, warmth and moisture, good tilth, the composition of soils, organic constituents, particularly the value of *humus*, the "soil's storehouse of nitrogen," the inorganic constituents of the soil, and their functions.

*Soil-fertility.* — Manure is applied to land to

increased its fertility, and this depends chiefly on the amount of plant-food in an available state.

In the absence of light and air, plants cannot thrive; waterlogged soil shuts out air; barnyard manure makes land more permeable to air. Crowded crops, such as broadcast-corn, exclude light, and thereby diminish the beneficial effects of manure.

*Good tilth*, or frequent and thorough stirrings, accompanied by good dressings of manure, produce a favourable condition of the soil. By these means the land is adapted to promote the office of the roots of plants, that is, to enable them to seize and appropriate the plant-food present in the soil. It is therefore clear, that the *physical* and *mechanical* conditions of the soil must be studied, as both are inseparably connected the one with the other.

All fertile soils are made up of two sets of constituents: organic and inorganic; the latter is the same as mineral. Organic matter is formed by the decay of plants; inorganic, of disintegrated, partially decomposed rocks.

From the decay of plants results *humus*, a blackish substance, destitute of organised structure.

*Humus* contains nitrogen, which is not available as plant-food until it is *nitrified*, a process carried on by *microbes*, that is, certain microscopic plants. Without warmth, moisture, and air, these tiny organisms cannot develop and reproduce themselves. Lime and potash must be present, as bases, so that nitrates may be formed, which plants absorb by their roots. Dung introduces plenty of these microorganisms into the soil, a function not exercised by chemical, or artificial manures.

As a general rule, dark-coloured soils contain plenty of *humus*, but in the red-sandstone formation the *humus* is, so to speak, masked.

Of the *inorganic constituents* needed to be restored to the soil, after cropping, three are only generally necessary: potash, lime, and phosphoric acid. The rest may, practically be neglected, as they are sufficiently present in all land.

Nitrogen, phosphoric acid, and potash need constant restoration to all soils; lime to some soils.

Now, what is *manure*? As commonly understood, manure is the solid and liquid excrements of animals mixed with the substances used for their litter.

And how shall we get at the value of any sample

of manure? Agriculturally speaking, the value of a mixen or dung-heap depends, first of all, on the amount of nitrogen, potash, and phosphoric acid it contains, and then upon the state of availability in which those three elements are; to these may be added its contents of potential humus.

Solid dung is the undigested portion of the food; urine contains products from that portion of the digested food that has done its work in the animal, but has not been converted into flesh, milk, wool, etc.

Why is the urine, weight for weight, of greater manurial value than the dung? Not only because of its larger per centage of plant-food, of nitrogen, and potash especially, but also because these constituents are immediately available for the nutrition of plants. Nitrogen, present in urine as urea, is quickly converted into easily assimilable plant-food, whereas the nitrogen in the undigested food in dung is slow to undergo the needful change.

In manure, 90 per cent of the total potash is to be found in the dung, as well as all the phosphoric acid and the lime, except in the solid excrement of the horse; but as regards nitrogen, one-half, or even more of it is found in the urine.

The composition and digestibility of the food will have much to do with the relative proportion of the fertilizing constituents in the solid and liquid excreta. On this point Warrington speak as follows:—"If the food is nitrogenous, and easily digested, the nitrogen in the urine will greatly preponderate; if, on the other hand, the food is one imperfectly digested, the nitrogen in the solid excrement may form the larger quantity. When poor hay is given to horses, the nitrogen in the solid excrement will somewhat exceed that contained in the urine. On the other hand, corn and cake yield a large excess of nitrogen in the urine."

The quality of the excrements, manurially speaking, depends upon the kind of the animal, the food it eats, its age, the condition and employment it is subjected to.

Approximately speaking, the value of the fresh solid dung of farm-animals runs as follows: sheep, pigs, horses, cows.

The urine may be classified, as to value, thus: sheep, horses, cows, pigs.

Boussingault, a celebrated French chemist of the earlier part of the century, gives the following

as the composition of mixed excrements, i. e., urine and dung together:

	NITROGEN		PHOSPHORIC ACID		POTASH	
	Per cent.	Per ton.	Per cent.	Per ton.	Per cent.	Per ton.
Horse, mixed excrements....	.705	Lbs. 24.1	.25	Lbs. 5.0	.134	Lbs. 2.68
Cow " ".....	.547	10.1	.08	2.6	.304	6.08
Sheep " ".....	.71	14.2	.29	5.0	.87	17.4
Pig " ".....	.37	7.4	.28	5.6	.....	.....

By which it will be seen that the mixed excrements of the horse and sheep contain almost equal quantities of nitrogen and phosphoric acid, and that the mixed excrements of the pig contain more phosphoric acid than that either of the other three. The mixed manures of horse and cow supplement each other, the former being rich in potash, the latter in the other two elements.

The composition of the excreta of animals is affected by:

*Their food*; the richer the food, the richer the excrements. If the food is rich in albuminoids, the more nitrogen will their dung and urine contain; and the same holds good as regards potash and phosphoric acid. And the digestibility of the food is of great importance, as any one can see at a glance.

As showing this effect of diet upon quality and quantity of manure produced, we may insert the subjoined table containing results obtained at Rothamsted by Lawes and Gilbert. The figures are from an experiment with cows fed with mangels (a poor food), and lucerne, or alfalfa, hay (a feeding stuff rich in fertilizing elements):

Fresh Manure per day.	MANGELS.		LUCERNE HAY.	
	Solid Excrement, 42 lbs.	Urine, 18 lbs.	Solid Excrement, 48 lbs.	Urine, 14 lbs.
	Per cent.	Per cent.	Per cent.	Per cent.
Water .....	83.0	95.94	79.70	88.23
Nitrogen.....	.33	.124	.34	.154
Phosphoric acid....	.24	.012	.16	.006
Potash.....	.14	.577	.23	1.690

*Age of the stock*, too, affects the quality of the dung they yield; for it is clear that the young animals has to provide for the growth of the frame and lean flesh, which are already nearly entirely formed in the matured beast.

"Stated approximately, 50 to 75 per cent of the three elements, nitrogen, phosphoric acid, and potash of the food of the former will be found in

the manure, from 90 to 95 per cent in that of the latter."

*Working* animals, as they may be called, i. e., those producing milk, flesh, or wool, yield poorer manure than those at rest; for a full grown beast, at rest, returns all the manurial contents of its food in its dung and urine. Cows work up about 25 per cent of the plant-food elements in their diet, and of course their manure is not so rich as the manure from fattening steers, which do not retain more than 10 per cent of these constituents.

So we see that :

The value of manure depends upon the quantity of nitrogen, phosphoric acid, and potash it contains.

That the richer the food, the richer the dung.

That the manure of mature animals, *ceteris paribus*, is richer than the manure of young and growing stock.

And it must not be forgotten that, though the more water an animal drinks the less rich will be its urine, still the constituents it contains will be just the same, though of course in a more dilute state.

That animals producing milk, wool, etc., make a greater draft upon their food than fattening stock or those which are mature and at rest or working. The manure of the former will not, consequently, be so rich as that of the latter.

We have also learnt that of the nitrogen, phosphoric acid and potash in the food supplied, by far the greater part (probably, as a rule, about 80 per cent) is returned in the excrement. Further, that both in nitrogen and potash, urine is much richer than the solid excrement, but the latter contains practically all the phosphoric acid excreted. The greater value of the urine, by reason of the solubility of its plant food, has also been observed. This fact points to the advisability of using a sufficiency of litter or absorbents in the stables, etc., so that the solid and liquid excreta may be applied together to the soil, for the best results are undoubtedly obtained by such a method.

(To be continued).

## The Farm.

### HEALTHY LIVE STOCK.

There are, perhaps, few departments in our social economy which have exhibited a greater display of perseverance and intelligence than that engaged in the improvement of our domestic animals. The Canadian stock owner claims just pride in his well-bred horses, the purity and renown of his cattle and sheep.

We cannot however, record the same progress or knowledge with respect to crops and land. Mere observation and acute natural intelligence, which have done so much for the improvement of stock, fail to do the same for the land and its crops, yet he is little behind his compeers in other countries in this respect. Soil, under the varied influences of climate, locality, drainage and moisture, as well as constitution, is capable of generating in the crops a nature which may not only render them valueless, but highly injurious as food. By the inelastic spirit of the laws with which the farmer is bound, he dare not exercise his intelligence with the view of improvement. This, and a host of other causes, such as the burden of taxes, state of foreign importations, prices, etc., have a material effect in crushing his spirit, and these, as comparatively modern evils, have stepped in to connect the past age with the present.

Beyond the bare fact that cattle and sheep are grown for sale, the farmer's pocket being enriched thereby, we must take into account the additional circumstance that they are grown too for human food, and the pockets of the farmer can only be permanently lined by the quality of the production. In other words, the health of the stock is of the greatest importance. If this is not good, the quality of the production is inferior; the public health suffers, the commodity is shunned for a time, and the credit of the producer is at stake. It may be thought, and indeed it generally is, that the killing of animals in the throes of death is the best and most humane way, and the sending of the flesh to the nearest butcher equally justifiable. But the public are now beginning to judge the proceeding as not only dishonest but criminal.

Hitherto, the relationship existing between the health of stock and that of the human population has not been properly understood. The depend-



ence of animals upon each other for their share of freedom from disease is also a subject that must claim greater attention than it has yet done. In both these departments there is a call for the exercise of skill and judgment. There is need for the adoption of principles which shall especially apply to the preservation of the health of our live stock, and thus secure sound flesh as human food; and the necessity for these once rightly understood by the farmer, he will find his profits much larger and more permanent than by attempting to make marketable the disreputable carcasses which find their way to the tables of the poor. Let him study the position which he occupies in relation to the public good. Like his corn and other farm produce, his cattle should be grown and sold in good condition. There is no reason why the losses on a farm should not be reduced to the smallest minimum and this may be done by taking advantage of the assistance which veterinary science can offer.

Our flocks of sheep are capable of being produced to an enormous extent, and to afford a corresponding yield of profit; and, as their carcasses form such a large proportion of human food, we have an additional reason that care should be exercised to insure the flesh being all that is desired in point of purity and excellence. There should be a closer union between agriculture and veterinary science. The wealth of a nation largely depends upon the health of its cattle and sheep. There are numerous diseases capable of being transmitted to man from both. Such diseases cannot be understood in their nature, origin, cause, cure, or prevention, by any but those who have had special training in medical science. The health of our flocks and herds means so much of health in the human population. Let the farmer grow rich by his success in breeding and rearing, for his riches bear a corresponding ratio to the comfort and satisfaction of the people who desire a wholesome food at a fair price.

J. LAURIE.

**CONSERVATION OF SOIL-MOISTURE.**

Of all the problems that the farmer has to consider, this one forces itself to the front. There is no subject so important in agriculture and none which has received so much attention of late years as the one which touches the conservation of soil-moisture. We know that a certain quantity of

water in the soil is necessary to render its fertile constituents available, and that a deficiency in this required amount makes a difference between a good crop and a poor one. A few figures will help us to understand the importance of this fact: 60 to 98% of water enters into the composition of plants, and this amount, large as it is, is but a fraction of the total sum required during the growth of the plant. It has been calculated, from reliable experiments, that in raising oats every ton of dry matter represents an expenditure of 522 tons; potatoes use 422 tons for the same amount and corn require 309 tons.

Great as these requirements are, the annual fall of water in our country would be quite sufficient to meet them, but owing to its unequal distribution and the irregularity of the rain-fall, our crops are liable to suffer severely from droughts, unless proper methods are employed to retain in the soil, at the disposition of the plant-roots, the water which it has received from previous rains. Too often, unnecessary loss of moisture is going on in our cultivated fields, during the summer days, till the quantity left is insufficient for the requirements of the plant. Then, no matter how good the soil may be in other respects, the growth of the plant is checked and the crop is reduced in yield.

The different methods recommended to prevent the evaporation of soil-moisture have been the cause of many discussions. Interesting experiments were conducted during last season at the Ontario Agricultural College, and in co-operation on a certain number of farms throughout the province, in order to determine which of these methods was the most efficient. At the O. A. C. 3 plots, situated on a gentle slope, were selected, each 1 square rod in superficies. On the first, the surface soil was kept loose by means of the harrow; on the second, the roller was used to keep it compact; on the third, oats were grown. Samples of earth were taken every day, at different depths, for 3 months, and the quantity of water contained in each determined. The results were as follows:

	1st foot	2nd foot	3rd foot
From loose surface:	17.7	19.6	18.7
“ compact surface :	17.1	17.6	17.9
“ plot growing oats :	17.2	18.9	16.6

Other tests were made on the following grounds :

1. Field growing turnips, clay soil, well cultivated during the period of growth.
2. Field growing wheat; clay soil.
3. Field growing barley; sandy soil.

	1st foot	2nd foot	3rd foot
1.	21.0	22.7	23.5
2.	20	18.5	18.1
3.	9.2	8.	8.6

If we compare these results with the theories that scientific investigations have furnished upon the subject, we see that they perfectly agree. In order to understand these theories, a study of the movements of the water in the soil is necessary: water in the soil is held under 3 forms: as hygroscopic, free, and capillary. The first is in intimate connection with the molecules of earth and can be driven off only by heat. The second, or free water, is not held by any force, but yielding to the law of gravitation, descends to a certain depth, varying with the permeability of the sub-soil. It forms the supply from which capillary water is drawn. This last one is so called because, acting under the force of capillarity—the same which causes oil to go up in the wick of a lamp—it moves through the soil in all directions, from moist to dry places, by means of the capillary (1) tubes—or interstices between the molecules of earth. The rapidity with which it moves depends upon the fineness of these tubes, that is upon the degree of fineness and compactness to which the earth has been reduced by tillage. In its ascending movement the water meets the roots of the plant, and what is not absorbed reaches the top of the ground and evaporates. But if the soil is stirred by the harrow or the cultivator to the depth of 2 or 3 in., the connection between these capillary tubes is broken, thus preventing the water from rising any higher than the roots of the plants. Accordingly, we find in the plot with a loose surface a higher percentage of water than in the compact one; and we see that the well cultivated field of turnips retains more moisture than the field of wheat or barley.

Many other experiments conducted on the same subject have proved conclusively the fact that, in all cases, an earth mulch is far preferable to a moisture-wasting crust. Farmers cannot afford to let their crops suffer from drought while by means of the cultivator they can store up this so precious moisture, which otherwise would escape uselessly, and thus secure far better and more abundant crops which will amply repay them for their extra labour.

CHAS. MORTUREUX.

(1) From the Latin, *capillus*, a hair.

## LUCERNE AS A HAY AND FODDER CROP

TO THE EDITOR OF FARMING :

In your issue of January 24th I saw an article on Lucerne clover, by Mr. A. Rawlings, of Forest, Ont, and thought he had taken the wind out of my sails, as I had thought of giving you my small experience. But as he gave us the value of Lucerne as a pasture only, I will, with your permission, give you my experience with it as a hay and green fodder crop.

In the winter of '97 one of the speakers at our Institute meetings recommended it very highly, and said he would not try to run a farm without it, and that he had then 27 acres seeded down with Lucerne. I took his advice and in the spring sowed two small pieces, one about three acres and the other just half an acre, near the barn to cut green for cows and pigs and help out the pasture. This was sown with peas and oats, which I cut green. Where I cut this feed first the Lucerne did the best and grew very fast after the peas and oats were off. In a few days it was a foot high and I turned the cows in several times. Then it grew till October, when I cut nineteen good cocks of hay (first year).

This last spring, on the 18th of May, I commenced to cut the Lucerne for pigs and cows at night. I have for years sown cow corn for this purpose, but I see that I will not need it any more. On the 1st of June I cut what was left, eighteen cocks; cut the second crop on July 8th, the third on August 18th, and as we got no rain for weeks I did not cut the fourth crop until October 10th, and it was some time curing but made good feed. These cuttings made 72 good 100 lbs. cocks of hay from half an acre besides all the green feed I needed for seven cows and a lot of pigs.

Lucerne beats anything I have ever sown for growing, even in dry weather. Through the very dry and hot time last summer it was about the only real green part of the place, and I found out the reason last fall; when I dug a ditch across one end of the field I found roots  $2\frac{1}{2}$  feet down. I think the plant goes the water, and consequently does not depend upon the rain.

The larger piece I only cut twice, June 9th and August 18th, and it gave a lot of pasture, and I noticed that the cows, and horses kept on it when there was lots of good feed elsewhere. The hay keeps its colour and looks as green now as when put in the mow, and the cows, horses and pigs



eat it now in preference to red clover. I have heard several objections to it, viz., that it is almost impossible to plow the sod under. (Perhaps Mr. Rawlings can tell us about that, as he has had some of it plowed.) Also that it is too woody, etc., which might be true if sown too thin and left standing too long. I cut it when in first bloom.

I sowed it thick and it grew straight up and fine like timothy. I would not sow less than 18 to 20 lb. of seed to the acre, and then it cannot stool out and grow big and woody stalks like a bunch of sweet clover (which it resembles.) The stocks are solid and it makes heavy hay.

Farmers as a class are called close or stingy, and I often think when I see some of them sowing clover seed that they deserve it. They try to make a peck of seed cover a big field, and then blame the seedsman because it is a poor catch. This is a very poor way to economize. I have not sown a bushel of grain in years without sowing clover with it, even when I turned it under for another crop. It pays well and will make poor land rich. I have proved it. Prof. Robertson says "Clover is King." We used to think clover hay would give horses the heaves. All nonsense, of course. They like it and will eat more than they really need. If you keep the manger full the horses will be full too, and if driven hard or worked their wind will be short. It is not the kind of hay but the quantity, except the clover, is badly cured and is musty, which causes the trouble.

But, Mr. Editor, perhaps you will think my wind is too good and I will close, but I never tire in talking about and recommending or advising farmers to grow clover, because it pays. I took six good loads off three acres this dry summer the first crop, and threshed eight bushels of seed from the second crop. Can you do that with a grain crop? I think not, and if Mr. Rawlings and I can persuade farmers generally to raise more clover, especially Lucerne, we will not have lived in vain. All of my neighbors who saw my two pieces this summer or heard about it say they are going to sow some next spring.

Thanking you for space in your really valuable paper (which I think no farmer should be without,)

I am, yours, etc.,  
W. H. DAVIS.

Tweed, Ont., Jan, 31st, 1899.

### A NEW USE FOR BARNYARD MANURE

A French authority states that farmers are wasting their time in using barnyard manure or refuse as a fertilizer. The contention is that the chemical constituents of manure, which alone are valuable, from such a small part (about 1.62 per cent.) that there is a great waste of time and labor in putting it on the land. The rest consists of water, of unassimilable woody fibre and mineral matter of which the soil has always a plentiful supply. All this is considered as dead weight which serves to retard the effect of the active constituents, and it is claimed that it would be better to employ the chemical constituents proper, a handful of which represents effectively the vegetative force of a ton of manure. It is also added that the small percentage which is of use is constantly wasting because of fermentation causing the gases such as ammonia to escape.

The director of the Pasteur Institute at Lille has devised a means of using these gases. To this end he advises covering the manure with a bell-shaped cover furnished with a tube that ends in a receiver filled with acidulated water. The ammonia, instead of dispersing through the atmosphere, could be collected in liquid form, from which the ammoniacal salts could easily be secured. It is also claimed that the other gases formed by fermentation, such as carbonic acid and gaseous hydrocarbons, will burn in the open air and if this received were furnished with a gasometer could be utilized for lighting the buildings on the farm. This is an ingenious plan and may come into use after a while. (1) It shows, however, what can be done when science is applied to agricultural subjects.—*Farming.*

### DISTRIBUTION OF CEREALS FOR IMPROVEMENT OF SEED.

TO THE EDITOR,

For the past ten years systematic efforts have been made to increase the average returns and to improve the quality of the cereals and other important farm crops grown in Canada by an annual distribution from the Experimental Farm at Ottawa, of samples of seed of the best and most promising sorts. These varieties have been first

(1) After a very long while. Ed.

tested at the Experimental Farms and only those which have proved to be the very best have been chosen for this distribution. The samples sent out have contained three pounds each and every precaution has been taken to have the seed in every instance thoroughly clean and true to name, and the packages have been sent free, through the mail. Those who have received such samples and grown them with care have usually had at the end of the second year enough seed to sow a large area, and in this manner careful farmers all over the Dominion have been gradually replacing any inferior and less productive sorts which they have been growing in the past, with superior varieties possessing greater vigor.

By instruction of the Hon. Minister of Agriculture, another such distribution is being made this season, consisting of samples of oats, barley, spring wheat, field pease, Indian corn and potatoes. These samples will be sent only to those who apply personally. Lists of names from societies or individuals cannot be considered, and only one sample in all can be sent to each applicant. Applications should be addressed to the Director of Experimental Farms and may be sent any time before the 15th of March, after which date the lists will be closed, so that all samples asked for may be sent out in good time for sowing. Parties writing will kindly mention the sort or variety they would prefer, and should the available stock of the sort asked for be exhausted some other good variety will be sent in its place.

WM. SAUNDERS,  
Director.

## The Orchard and Garden.

(CONDUCTED BY MR. GEO. MOORE).

### A HARDY PERENNIAL

#### *Eulalia Japonica Zebrina.*

A very remarkable and beautiful variety of a gigantic Japanese grass, easy of culture and which forms elegant clumps on the lawn or in the flower garden. As will be seen by the illustration, the



*Eulalia Japonica Zebrina.*

variegation is formed by horizontal bands at regular intervals across the leaf, instead of lengthwise as is usually the case.

### CAMBIUM (Continued).

In Bengal the Date Palms are tapped for making sugar, like our maples, and the juice runs more freely during the night; that which is gathered during the day is thrown away as worthless. This is accounted for by the fact that the leaves have not been at work elaborating the sap during the night, therefore it is descending in the form of cambium or elaborated sap, and is rich in saccharine matter, while during the day, the juice which exudes from the Palm tree is merely the sap ascending and is comparatively worthless.

### HEAVY SEEDS.

Mess. Hicks and Dalney of the United States' Department of Agriculture have proved by experiment, the superiority of heavy over light seed, not only were the plants grown from heavy seed, heavy in the same ratio as the seed planted, but peas were ready for the market five to six days

earlier : an immense advantage, because the earliest always command a high price.

If the seed is heavy and well matured it is evident that there will be a greater weight of nourishment stored up in it for the use of the infant plant in its earlier stages, thus enabling it to send out robust roots and establish itself well in the soil. To know that seed, like animals, is well bred is another consideration, for early maturity, vigor, and abundance of the crop will in some degree depend upon this. Good seed will be large plump and heavy, and its power of germinating strong. It is one of the worst practices to sell the best seed because a little extra price can be obtained for it, and keep the poor to sow. Of course soil and climate have a great influence upon the crop after it has become established in the ground, but selection of seed should claim our earnest attention because a fair start is half the battle.

#### POTATO MANURES.

Experiments made last year in Scotland with regard to the manuring of potatoes lead to the following conclusions, which should be of service to our growers, because manure with many is of primary importance. Farm yard manure, about fifteen tons to the acre gave a very satisfactory return, but with the addition of 400 lb. of superphosphate, 100 lb. each of sulphate of ammonia, and sulphate of potash, the yield was 1 ton 2 cwt to the acre more.

Artificial manures, 6 cwt of superphosphate, 2 cwt sulphate of ammonia and 700 lb of kainit applied without any farm yard manure gave about the same return as the manure above, and when the labour of applying is taken into consideration, especially if the manure had to be handled for, is much cheaper. But it must be remembered that the artificials applied must supply nitrogen, phosphoric acid and potash.

There is no doubt that the best way to manure the potato crop is by the use of a moderate quantity of farm yard manure, with a top dressing or two, during their growth, of nitrate of soda, and superphosphate, which would be worked into the soil during the process of cultivation.

#### SUGGESTIONS FOR YOUNG GARDENERS.

No young man should attempt to make gardening his occupation who has not a taste for it. A man might be a good mechanic or mathematician who would not take an interest in the productions and processes of nature, a knowledge of which is essential to a successful horticulturist.

A young gardener will do well to make himself familiar with the current topics of the day and do all he can to expand his intellect ; he will thus render his mind more ready to discern, understand, and retain certain abstruse theories relating to his profession, and by exercising his common sense, he will be able to judge of their results, when carried into practice, which he will find a great advantage.

A full knowledge of botany, so as to be able to recognize all the flowers and plants that grow, is not absolutely requisite to make a man a successful gardener, but he will do well to study carefully the natural order, or family to which plants belong, their native countries, and the altitude at which they grow, because they may come from the same region and be quite different as to the climate that will suit them when removed to a place foreign to them ; those which thrive on the sides or tops of the mountains of a tropical country will endure a much lower temperature than those which grow in the warm, close, moist marshes of such localities as Java or Borneo.

When a new plant comes under your notice or charge, first find out all you can about it and where it comes from, and read up the particulars, geographically and otherwise, of its native place ; this will add to the interest you take in its cultivation.

Attention to what may be considered by some unimportant details, diligence, watchfulness as to how the process of culture adopted are progressing so as to make any changes as promptly as possible, are never to be lost sight of ; the careless, inattentive gardener never succeeds, carelessness and sloth are worse than ignorance : the last may be overcome more easily than the first.

Recreations, such as athletic sports and innocent amusements, should not be condemned or neglected, because they will help to keep a sound mind in a sound body, but they should not be indulged in to such an extent as to interfere with duty, or the hours which should be spent in the study necessary to its proper performance.

There are good opportunities, even in these days of keen competition, for good gardeners. Horticulture has come to the front of late years, and is yearly becoming popular, many of our farmers younger sons would do well; if they have any taste in that direction, to develop it, and if they will do all they can to make themselves proficient, they can secure good situations as gentlemen's gardeners in which they gain an honest and respectable living for their families.

All may not be thus fortunate, but the chances of preferment lie before the deserving. There are not a few gardeners who have retained their situations for years, living in the garden house, have maintained a pleasant relation with their employer and his family by having, in some measure, administered to their pleasures, and if they have been faithful and contented, have been as well off, in their humble capacity, as their employer whose responsibilities to society have been greater.

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### PERPETUAL STRAWBERRIES.

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Under this title M. HENRY DE VILMORIN contributes an interesting illustrated article to the Journal of the Royal Horticultural Society. He narrates the efforts to produce a large strawberry, possessing the peculiarity of the Alpine, which blooms and bears fruit from April to November, and even later when the weather is mild, in the latter part of the year, whereas the large-fruited strawberry blooms and fruits only once in a season. Many attempts were made to cross the Alpine with a large fruited variety, but none of the results were altogether successful until a seedling, named St. Joseph, was raised by ABBE THIVOLET of Chenoves, France. This variety flowers and fruits continuously from May till November, and bears fairly large fruit of excellent flavour. It was still blooming in M. H. DE VILMORIN'S garden on November 26th, 1898. The writer believes that we shall see hereafter numerous other varieties of perpetual large-fruited strawberries; and he remarks that the St. Joseph will bear improvement, as it "is rather dwarfish and depressed," while "its leaves, which are of a dark bluish green, are mostly spread flat on the ground," and "the stems are short and need supporting to raise the fruit from the soil."

### GROWING RASPBERRIES FOR PROFIT.

It is not my intention in this article to enter into elaborate details upon the culture of the Raspberry, nor do I purpose to present to the reader a conglomerate mass of facts, but rather to set forth in as clear a manner as possible, the best and most practicable method of growing raspberries for profit, in the Province of Quebec. Many farmers seem to have the idea that there is little or no profit in the cultivation of this most delicious fruit, and that if a few plants are stuck in the ground in any corner of the garden and left to themselves, they will do quite as well as if they were properly cared for and cultivated. A great deal of this is no doubt due to the fact that wild raspberries grow so well in this Province, that people do not realize the value of cultivating the garden varieties, and this is probably the reason, why one notices in so many gardens, a constant struggle between the raspberries and wild parsnips which very often results in a victory for the parsnips.

To grow raspberries profitably it is necessary to have the proper kind of soil, the hardiest and most saleable varieties, and to employ the greatest care in picking and marketing the fruit; it is also of the utmost importance that no weeds be allowed to grow in the raspberry bed, and that close attention be given to winter pruning and protection.

In selecting the proper location for a raspberry bed, one of the most important considerations is that of under-drainage; if the land is thoroughly underdrained, the plants will thrive either in sandy loam, or in clay soil, although preferring the former. If it is not possible to thoroughly underdrain the land, care must be taken that the bed is in such a position that it can be easily water-furrow-face-drained, as nothing is so disastrous to the plantation, as to have water standing in any part of it.

Raspberries delight in a rich soil, and will grow most luxuriantly where the land has not been too heavily cropped the previous years; this fact is quite evident when one observes how they thrive even along old fences and in rocky places, where very little else grows on account of the stones.

The best season of the year for setting out a raspberry bed is in the fall, after the wood has thoroughly ripened, and a few weeks before the ground freezes up, but it may also be set out in the spring to good advantage, and in fact this

season is preferred by some growers. The land must be thoroughly worked, summer-fallowed, if possible, in order to rid it of all young weeds, and it should then be drilled up in rows from five to seven feet apart, according to variety. If the variety is dwarf and does not propagate very quickly, as the London or Marlborough, they will be quite far enough apart in rows of five or five and a half feet; but if they are such varieties as Cuthbert or Golden Queen, they will require drills quite seven feet apart. Nothing but year-old plants should be used for setting out if the best results would be obtained, and if they are dug from a young plantation, they will be much more vigorous and sturdy than if from an old one. When the plants are set out, they should be cut back to less than two feet in length, in order that the roots may take a firmer hold of the ground.

When the plants have been set out at a distance of from one to three feet apart in the rows, a light furrow of earth may be thrown up to them from each side, and they may then be left for the winter. During the following spring it will be necessary to use the cultivator freely and to hoe the patch a number of times, to keep the weeds in check. A light plough may also be used to good advantage between the rows and the land by this means kept well pulverized. In the course of the summer, as the young plants send up the slender shoots, only three or four of the strongest should be left to each hill, and the rest may be cut away during the hoeing process.

The time of harvesting the crop is decidedly the busiest one in raspberry culture, and much depends upon the season, whether a profitable crop is harvested or not. If the weather is rainy and damp during the season in which the berries are ripening, many of them will fall off, and thus become a total loss to the grower, but if the weather is fine and cool, so as to prevent the berries from ripening too fast, a good opportunity will be had to gather the fruit, and if one is active there will be need for very little, or comparatively no loss.

The average raspberry picker is a very careless person, and unless considerable attention is paid to him, he will knock off and destroy more berries than he picks. It is therefore very important that in a large raspberry plantation, where a number of pickers are employed, there should be some thoroughly experienced person to look after them, and discharge those who are too careless. Whilst

the general custom is to hire pickers by the day, in many cases it may be found more convenient and profitable to pay by the box, the usual price being from one to two cents per quart; by this method there is less chance of the picker taking advantage of his employer, and at the same time a good picker can earn a very fair day's wages.

The method of packing and shipping the fruit depends largely upon ones proximity to a ready market. Many growers market their raspberries in wooden pails made especially for this purpose, and this method is good enough if the berries are soft varieties, and one is a considerable distance from a market, but if the berries are firm varieties and of superior quality, they will command much better prices if shipped in quart berry boxes. These boxes can be packed in crates holding from three to six dozen each, and so constructed as to allow a current of air to be continually passing between the boxes, and in this manner, if they are properly handled, they will arrive on the market with a fresh appearance which will greatly improve their sale. Of course, if one is growing raspberries for a canning factory, or to be manufactured into jam, the wooden pails will be found satisfactory, but if the berries are first-class varieties intended for table use, they must be presented to the purchaser in the most tasteful manner possible, in order to command the best prices.

In large cities, it will be found of the utmost importance, that the berries arrive upon the market as early in the day as possible, in order to ensure quick sales, those that have to stand over till the following morning begin to have a stale appearance, especially if the weather is hot, which greatly detracts from their selling value.

Although giving due attention to the appearance and quality of the varieties grown, it is also necessary that they should be of a hardy nature, that they may not suffer too severely from the winter frosts. To combine these three qualities is an interesting problem, and is best solved by careful experiment in the various localities where raspberries are grown. The Cuthbert and Golden Queen fulfil the first two conditions admirably, but in very severe seasons they are apt to winter kill. The Marlborough is a very fine berry in appearance, and is also quite hardy and has the additional advantage of being early, but it is sadly lacking in quality. A variety that gives promise of becoming one of the leading berries is the

London; it is a dwarf variety with large berries of a bright red color, and very good quality; the canes have proved perfectly hardy so far, and being of a dwarf nature they are better protected by the snow than the long-caned sorts. Among other varieties which have proved more or less successful are Brandy-wine, Clarke, Hansell, and Brinckle's Orange.

An important part of raspberry culture is that of pruning. This should be done as soon as the crop is gathered. It consists in removing, not only all the old canes, but also many of the new ones; these should be well thinned out and none but the strongest left. If this is done as soon as the crop is off it will allow the remaining canes to become thoroughly matured before the frost comes. When the first frost comes, and the canes have ceased to grow, cut the tips off with a large pair of shears thus lessening the danger of the canes being broken with the weight of snow during the winter.

In this northern climate the subject of winter protection in the culture of raspberries becomes an important one, and if neglected, is likely to be followed by disastrous results, especially if the varieties grown are not very hardy. Many methods of winter protection have been tried with only a limited amount of success, and probably the best one is that in which the canes are laid down and covered with straw or other litter. Another plan is to bend the canes so that they shall be completely covered with snow, but great care must be exercised, in the latter case, that the canes are not broken during the process.

Raspberry-growing, like most other branches of horticulture, has its risks, and the profits vary greatly in proportion to the conditions of the weather, but those engaging in it will find themselves well repaid, if they take it up in a systematic manner, and pay careful attention to details.

M. JACK.

## Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

### UTILISING COLD MEATS

In every house there are small bits of meat which will collect in spite of the best supervision, for however carefully one may calculate, appetites vary so much, from change of weather and many

other circumstances, that it is next to impossible to buy the exact quantity needed for consumption.

The next best thing to do, is to find out several nice ways of preparing these odds and ends, so as to convert them into palatable dishes.

The recipes for doing this are numerous, but new and tried ones are always acceptable, and the more so just at present where members of families have, or are just recovering from, the influenza which has spared few people this winter.

To make these dishes savoury is the great art, for without judicious seasoning they will only be just common dishes.

They sound much more troublesome in the reading than in the making, for what is the good of recipes to young beginners if everything is not fully explained.

A mincer will do the work in a quarter of the time taken in chopping.

In seasoning, be very careful in adding salt if you have used bits of cold ham or salt beef; one thing to be remembered is, that the cook must always taste her dishes before placing them on the table, after which she can feel that she has done her best, and will have the satisfaction of placing her best efforts before the family circle who will always be the kindest critics.

### MINCED CUTLETS.

When nicely prepared and tastefully served these are always very heartily enjoyed and fully appreciated. They can be made from the remains of almost every kind of meat, mixture of meats, poultry, or game, the method of preparation being in each case exactly the same. First of all free the meat from every particle of bone, skin, gristle, &c., and chop it very finely, then put it into a bowl with plenty of appropriate seasonings; add one-third its weight either in smoothly mashed cooked potatoes, bread crumbs, which have been soaked in milk and squeezed dry, or fine rice, previously boiled in milk until quite soft, and pound the whole to a smooth paste, bind the mixture with one or more well beaten eggs, and form the whole into small cutlets; egg and bread crumb these in the usual way, pressing in the coating gently with a broad-bladed knife until the entire covering is quite firm and even, then fry in boiling clarified fat until coloured a lovely brown and nice and crisp. When done enough, take up the cutlets, drain carefully, and dish up as tastefully as possible.

A most dainty, attractive style is to arrange the cutlets in neat order upon a border or ring of well-mashed and pleasantly-seasoned potatoes, and to fill in the centre with a high mound of some other skilfully cooked suitable vegetable; garnish the outside with sprigs of parsley, and send to table very hot, accompanied by some good gravy. Or, if preferred, dish up the cutlets upon a bed of mashed potatoes, and pour the gravy round the edge. While yet another way is to dispense with vegetables altogether and to serve the cutlets perfectly dry and crisp, tastefully arranged on a fancy dish paper, freely garnished with sprigs of hot fried parsley.

#### FISH CUTLETS OR CROUTONS.

Fry together over a gentle fire two ozs. of butter and one oz. of flour, then add a seasoning of salt, pepper, and grated nutmeg, a dessertspoonful of finely-chopped parsley, a teaspoonful of anchovy essence, and one-third of a pint of milk, and stir constantly until the sauce boils gently, and becomes of a thick, smooth, creamy consistency, after which stir in, off the fire, one well-beaten fresh egg and half a pound of any nice, white fish previously cooked, freed from bones and skin, and beaten to a smooth paste. When thoroughly blended and quite cold, make up into tiny cutlet shapes, which must be coated with egg and bread crumbs, and fried as already directed. Drain carefully in order to render the cutlets crisp and dry, then dish up quickly on daintily fried croutons of stale bread, which have been arranged in readiness on a nice hot dish; garnish with slices of fresh lemon and sprigs of parsley, and serve the whole very hot.

#### A FISH SAUCE.

Sauce Hollandaise may be made by mixing one tablespoonful of butter and one of flour in a saucepan and adding gradually half-a-pint of boiling water. Stir until it reaches the boiling point; take from the fire and add the yolks of two eggs. Into another saucepan put a slice of onion, a bay leaf and a clove of garlic; add four tablespoonfuls of vinegar, and stand over the fire until the vinegar is reduced one-half. Turn this into the sauce, stir for a moment; strain through a fine sieve, and serve. This sauce may be varied by adding lemon juice instead of vinegar, or by using

the water in which the fish was boiled. It is one of the daintiest of all sauces to serve with fish.

#### TO PICKLE AN OX TONGUE.

Choose a plump tongue with a smooth skin, as these are sure indications of its being young and tender; then, after soaking it in cold water for an hour, drain it and trim it neatly by cutting away the root, being careful to leave a little of the fat. When thus prepared, lay the tongue in a deep earthenware pan, and pour over it a pickle composed of the following ingredients: One pound of bay salt; six ounces of common salt, one ounce of salt prunella, one pound of moist sugar, a score of peppercorns, a bunch of savoury herbs, one ounce of salpetre, and one gallon of water. These ingredients must be boiled together for twenty minutes, then the liquid should be carefully skimmed, strained through a piece of muslin, and allowed to cool. When quite cold it is ready for use. Let the tongue remain in the pickle from ten to fourteen days, a longer time being required in winter than in summer; then when taken out rub it well with a clean dry cloth, and either cook it at once or hang it up to dry.

#### A PICKLE FOR BEEF.

Put the beef into a deep earthenware pan that will just nicely hold it, and cover it entirely with a pickle made in the following proportions: One pound of bay salt, six ounces of common salt, an ounce of salpetre, two ounces of salt prunella, half a pound of brown sugar and one gallon of water. Boil these ingredients for twenty minutes, then skim carefully, strain and use when cold. This pickle can be used over and over again if after each time of using it is reboiled with the addition of a little more salt.

(*Vinton's Agricultural Almanac.*)

#### THE TIME FOR BABY TO SIT UP.

People sometimes ask: "At what age can we seat a child in a chair; when put him on his legs; how old must he be before we can teach him to walk?"

"The answers are easy," says a writer in the *Popular Science Monthly*. "He must not be made to sit till he has spontaneously sat up in his bed and has been able to hold his seat. This sometimes happens in the sixth or seventh month,

sometimes later. The sitting posture is not without danger, even when he takes it himself. Imposed prematurely upon him it tires the backbone and may interfere with the growth. So the child should never be taught to stand or to walk. That is his affair not ours. Place him on a carpet in a healthy room or in the open air, and let him play in freedom, roll, try to go ahead on his hands and feet, or go backward, which he will do more successfully at first; it all gradually strengthens and hardens him. Some day he will manage to get upon his knees, another day to go forward upon them, and then to raise himself up against the chairs. He thus learns to do all he can, as fast as he can, and no more. 'But,' they say, 'he will be longer in learning to walk if he is left to go on his hands and feet indefinitely.' What difference does it make if, exploring the world in this way, he becomes acquainted with things, learns to estimate distances, strengthens his legs and back—prepares himself, in short, to walk better when he gets to walking? The important thing is not whether he walks now or then, but that he learns to guide himself, to help himself, and have confidence in himself. I hold, without exaggeration, that education of the character is going on at the same time with training locomotion, and that the way one learns to walk is not without moral importance."

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## The Flock

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### OXFORDSHIRE DOWN SHEEP.

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In no particular should greater heed be paid to local custom than in the selection of live stock on the part of those who wish to farm profitably. The light horses which we find on, say, the Cotswold Hills (England) would be out of place on the Essex clays, and strong reasons should be forthcoming before Jerseys should be introduced on to heavy land. In like manner it will be found that some peculiarities of soil, climate, rotation, and market, often makes the prevailing breed of sheep to be by far the most suitable for a new comer to purchase. Whether arable farming can be carried on profitably, apart from profitable wheat growing or not, suggests to the agriculturist, the looking to the hoof as well as to the bushel for a profitable return on his capital and labour.

I do not say for a moment that it is either likely or desirable that the breed of sheep, should supersede all others: yet for the county from which they take their name, and perhaps for some other counties in the midlands of England, sheep of the above heading, need fear no superiors. It is the boast of the Oxfordshire Down breeders, that these sheep combine the size and the fleece of the Cotswolds, with the colour and flavour of the Down: (1) and when seen at their best, there is much to justify this assertion, though any average flock, I will admit, bears clear evidence of the compromise between size and quality, wool and mutton.

For breeding lambs for the butcher, the Oxfordshire must yield the palm to the Hampshire, whose rich milk force the lambs along to early maturity. Consequently on heavy land, where, as a rule, farmyard manure is at hand, and where other circumstances tell in favour of lamb, rather than mutton, Hampshires will doubtless remain in favour. But on light land, where the farmer has to rely on the flock as his chief source of manure, and where it is possible and necessary to keep the flock in the open the greater portion of the year, the Oxfordshire are likely to hold their own. To produce or obtain an adequate supply of farmyard manure is out of the question in many light land districts: phosphates and other artificials—however valuable as auxiliaries—cannot be entirely relied upon. Not only do the sheep supply the manure, but they also save their owner the cost of carting and spreading it, which in these days of diminished profits, when every superfluous expense should be cut down, becomes an important consideration. The very treading, which is so much dreaded on heavier soils, is absolutely beneficial and even necessary on the light hilly lands, and often a field of wheat in danger of losing plant in the autumn, through the hollowness of the soil, when the weather was to wet to permit of rolling, has been saved by a few turnips being scattered over it from carts, and the sheep turned in to impart by treading the necessary firmness.

A large breeding or, still more, a large feeding flock, requires a considerable amount of labour to supply their wants, consequently, help has to be kept on all the year round, out of whom the farmer gets far better worth than from hiring of casual labour.

If possible Oxford Downs should be bred and

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(1) Which is exactly what they are, the cross having been begun and perfected by Druce of Eynsham. Ed.



fed on the same farm. To this rule, as to all others, there are of course exceptions, for no more common mistake is made than that of assuming that successful practice in a particular district is sufficient to lay down hard and fast rules for other districts, where totally different conditions prevail. Still the advantages of breeding over buying in must be apparent. Buying in, even from the same county, often involves changes from a gravel soil to clay, from sheltered vale to bleak hill-side, and from pasture to arable. The food produced under the same rotation, and from the same seeds, varies in qualities upon different farms, as do also weeds. The latter sometimes prove most injurious, when being novel they are eagerly devoured, as they often are, by imported stock. With horses, cattle, and to some extent with pigs, individual examination of the animals at the time of purchase may be possible. With sheep this is almost out of question; and foot-rot, scab, and other diseases may develop in a few days in one or two animals and thus infect the many. It is also the rule, when drafting sheep for sale, to include all that have not a clean record.

The result is that the buyer often incurs serious loss to both flocks and crops by one or two jumpers leading the others out of the fold; while ewes often prove to have but one quarter, and some "wethers" are not what they seem.

The writer once knew a man who took a lease of an Oxfordshire sheep-farm, upon which he found a flock of Hampshire Down ewes, placed there by the previous tenant, who had been fond of experimenting. Being anxious to adopt the county breed, and at the same time to avoid the risk of importing disease with new animals, the ingoing tenant took the whole of the breeding ewes at a valuation.

Grey-faced Cotswold rams were put upon them, the resulting lambs being of course half breeds. The darkest faced, most "downy," and best all round ewe lambs were selected for breeding, those following too closely to the sire being fed. When about eighteen months old these were mated to shearling rams from well known and long-established Oxford Down flocks; and by continuing this process of careful selection both of lambs and sires, the flock in a few years became a full average one of its kind.

Where each year there is a draft of ewe tegs into the breeding flock, it is necessary to dispose of the rams after two years service, unless it is con-

venient and thought desirable to separate the ewes into two or more lots, otherwise the rams would be serving their own stock. Under these circumstances it is often both advantageous and economical to buy rams which have seen two, three or even more years service. The ram lambs and shearlings which one sees in the sale ring are very taking to the eye. Master and shepherd have done their best to cover up their imperfections, and to bring out the best points in the animal for sale. The means are, as a rule perfectly lawful, and simply show that the owner is a good business man. But it is well to remember that, when these animals have served their purpose on one farm, they are often sold at mutton-price, while their stock getting powers are at their best.

In buying a young entire animal, there is always a possibility of his proving unproductive, or of his stock not following their sire. It is therefore often worth the while of the flock-owner to ascertain the history and to inspect the progeny of rams which have seen a year of two of service, and are then sold for no fault. They may not be so taking to the eye as they were when in the sale-ring as lambs or shearlings, but this is a case where "handsome is as handsome does." Often vast improvement has been made in a flock, by purchasing old prize-sheep, which had been previously purchased in the show-yard regardless of cost, by wealthy flock-owners, and, when no longer of use to the latter, the animals were obtainable at but little advance on butchers' prices.

Occasionally, where the ewe lambs are not selected with sufficient care, or where rams do not produce the results expected of them, a tendency to revert to the Hampshire or to the long wool type will manifest itself in most Oxford-Down flocks, after they may have been thought to be well established. In this event the evil can be corrected by using tups which are strong in those features which it is desired to restore.

In cases where buying in is found to be necessary, either as a rule or in consequence of enlarging the holding, or an altered rotation, less risk is run by buying the animals at some private sale rather than at a public market or fair.

Whenever sheep are purchased at a market, or whenever satisfactory antecedents cannot be established, a few days or weeks of quarantine should be enforced, during which each animal

should be carefully examined before it is allowed to mix with and become one of the standing flock of the farm.

W. R. GILBERT.

### SHEEP VERSUS DOGS

A new England sheep-raiser claims to be able to keep dogs from his sheep by a barbed wire fence, so constructed that neither the dogs nor the sheep can get through. The fence consists of seven strands of barbed wire on posts eight feet apart, with a wooden rail below the top wire to steady the posts, the total cost being \$67.20 per mile, which seems very low. The first strand of wire is put very close to the ground so that sheep and dogs cannot crawl under, and should not be more than three inches from the ground at any point. The second wire is put four inches above the first, the third five inches above the second, the fourth six inches above the third, the fifth six inches above the fourth, and the sixth eight inches above the fifth, then a wooden rail eight inches above the sixth wire, and a seventh strand of wire eight inches above the wooden rail.

Such a fence would certainly enable a farmer to protect his sheep from dogs. There is one strong objection to a barbed wire fence for such a purpose and that is that so much wool would be lost by the sheep coming in contact with the barbs. The writer states, however, that this would not amount to much even in a large flock of sheep.—*Farming.*

*Farming.*

### The Dairy.

#### CHEESE CURING ROOMS

To the Editor of the JOURNAL OF AGRICULTURE :

DEAR SIR.—It is the intention of the local Government at Quebec to offer a bonus for the changing or remodeling of curing rooms in cheese factories. The plans are not quite ready at present, but will be in a short time.

It is a well known fact that the best English and Scotch Cheddars fetch about 20 shillings per cwt. more than the Canadian Cheddars. Now, the question is why this enormous difference of about 4 cts. per lb.? Is it because the cheese is better made; is it because the raw material (milk)

is richer or better; or, is it that the knowledge possessed by the maker is greater than our makers in general possess.

It can hardly be the last, for it is not such a long time ago that some of our best makers here in Canada, were engaged to go to Scotland to give lessons in Cheddar cheese making, as we were supposed to have got it down to a regular science. They visited all the principal dairies in that country and put them on the system of uniformity as practised here. It cannot be that the milk, the raw material, is better than here, for is it not the Ayrshire cow, the principal one, (1) as she is in the majority here, in fact in this province of ours the milk of the Canadian cow is far richer than the Ayrshire, because she is descended from the Jersey. (?)

I have now come to where the great difference lies between the quality of the cheese: it is in the curing process. Here in Canada, where the thermometer is up in the nineties sometimes several days at a time, and the boards not too close together, the cheese almost melting, the very best part of it, the fat, running down on the floor: this is where they are spoiled or rather deteriorated in quality. In Scotland, the weather is very cool and moist, they have cellars built on purpose where they have perfect control of the temperature, and means of heating them when the weather is cold, so that, it never varies more than 5 degrees, 60° to 65° being the extremes in the curing-rooms.

The cheeses are kept for a longer period than we in Canada keep them, and as they ripen slowly, of course the keeping qualities are greater than here; we have a saying with apples: "early ripe early rotten," and vice versa, so it will hold good with cheese likewise.

The local government intends offering a bonus to assist the owners of cheese factories to make the curing rooms so as to control the temperature. By the free use of felt paper and double windows, and even double glass in each window, the rooms can be made to exclude the heat, and then by the use of ice, the rooms can be cooled to the proper temperature. Ice does not cost much here in Canada, and where the thermometer goes to 30 degrees below zero is made quite cheaply; it is not a hard matter to preserve it; a very common shed to prevent the sun from shining on it and at the same to prevent the rain from wetting the saw-

(1) In Scotland, not in England, where the Shorthorn, reign. Ed.

dust, a very cheap balloon frame, with one tier of boards; pack in the ice, leaving say 12 inches all round between the ice and boards, for the sawdust to keep it from melting, covering with long straw or wild hay. Hay is the best material, although sawdust may be also used for the covering.

There yet remains another method of cooling the room instead of ice, by digging a trench 4 to 5 feet deep, say, 100 to 150 feet long, and by laying, say, 10 or 12 separate tubes with common 3 inches drain tile the whole distance, and having a sort of box at the further end for the air to enter. In passing through these drain tiles the air is cooled and a certain amount of moisture taken in also, this air is conducted into the curing rooms, cools it, and gives it sufficient moisture. Where the air enters the room it must be regulated by a sliding panel to be opened or shut at will, and in this way, it is thought by close attention to these few rules, the makers will be enabled to control the temperature in their respective factories. In that way, we shall improve our cheese, and try at all events, to reduce the difference of 20 shillings between the best Scotch and Canadian Cheddars, slowly at first, no doubt, but we should at least get it reduced one half.

Yours truly,

PETER MACFARLANE.

Chateauguay,  
25th, January, 1899.

Will not even Mr. Macfarlane allow that the splendid old pasture of the Cheddar Valley, which we knew well 60 years ago, may have something to do with the superiority of the Cheddar cheese?—Ed.

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### BABCOCK TESTS VS. CHURN TESTS

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In reply to recent inquiries on this subject, Prof. W. A. Henry of Wisconsin Experiment Station, Madison, Wis., writes to me as follows, under date of December 27, 1898:

"Replying to your inquiries, will say: First, without being able to prove my statement, but basing my judgment on the results of the most carefully and fairly conducted dairy tests, I believe that most of the records showing thirty pounds or more of butter in seven days are unreliable. I do not affirm that the parties did not

get thirty pounds of something which they called butter for the seven days, but I am firmly convinced that a large part of these so called records were not honest, merchantable butter. I believe that private tests with dairy cows, and those where the milk and butter are not analyzed, are no more reliable than private trotting tests would be with horses, for human nature is the same in the owners of both these animals. Second: I believe that the Babcock test together with the scales combined give us a far more correct method of estimating the butter capacity of a cow than the churn itself. This is true, because with these two instruments we can determine the total quantity of fat yielded by a cow in a given time, and when a cow has produced this fat she has done her part and is entitled to full credit. The churn is not a measure of a cow's butter productive capacity, because fat may be lost both in separation and churning, and the cow cannot be held accountable for either of these losses. Again, unless the butter is analyzed it may not be a merchantable product, for which fault again the cow is not to blame, nor on the other hand should she have credit for water, casein, extra salt, or all of these, which the worker through his desire for a large production may leave in excess in the butter. Of course the Babcock test can be wrongly used, or it can be misrepresented, but with the scales it forms the simplest and most direct combination for measuring a cow's butter value. A man who will cheat with the churn will also cheat with the Babcock test, but the skimming device and the churn may both cheat the cow when the man or the committee are honest. This the Babcock test will not do. By means of properly conducted official tests, and the use of the Babcock test, the representatives of our various breeds of dairy cattle are in a position to establish records which are reliable, and in time will become immensely valuable, as data accumulate and the effects of breeding and selection are realized.

"W. A. HENRY,  
Dean and Director."

This letter should be in the hands of every dairyman and every breeder of dairy cattle. Before the invention of the Babcock test the churn was the only practicable means for testing cows within the reach of dairymen. It is probable that the earliest tests did not give full credit to the cows. As strife for extraordinary records grew there seemed to be no end to the number of pounds

that might be reached. One record passed 46 lbs. in seven consecutive days; the cow and the whole process of making was in the hands of an intelligent committee. The World's Fair threw a great light over such records. Cows that had been credited with 30 lbs. and upwards, under most favorable conditions at that fair failed to make 20 lbs. of butter of 80 per cent fat in the ordinary period of seven consecutive days. It was a great surprise. The public lost all confidence in the great records that had been reported. If these tests had no other effect they were not altogether vain.

With view of finding out how some of those great records might have been made, I took a quantity of rich cream, properly ripened, and churned it at a low temperature until it reached the point described by the word "broke." If it had been chilled it would have been about as dry as snow. An enthus'astic record maker might have reasoned in this way, "It is not cream, it is not buttermilk, therefore it must be butter." I estimated its weight 46 lbs. and it contained 33 per cent fat. I added ice water and again started the churn. When it appeared as granules about the size of wheat, I drained off the buttermilk and let it stand draining several hours. No one not a practical butter maker would have had suspicion that it contained an excess of moisture. It weighed 18½ lbs. By chilling it still more it might have been salted without loss of weight. A thoroughly conscientious man, unfamiliar with butter making, might have readily endorsed this weight as the correct one of a merchantable product. I warmed it up, salted it, and found it produced 11 lbs. of merchantable butter. It would make all the difference in the world whether a cow had a record of 18½ lbs. or of 11 lbs., or double these figures, 37 lbs. in seven consecutive days, made one way, or 22 lbs. made another way. I do not pretend to know other ways, doubtless more fraudulent, by which great records may have been made. But I know butter by the churn is an indefinite quantity. In the light of the present we can put comparatively little value on records made by it.

The following letter recently received by our firm shows that there are some persons who are willing to instruct others in the mysteries of making large records by the churn:

"Toronto, January 9, 1899.

Messrs. A. & G. Rice:

"Dear Sirs.—We have fitted up the dairy of

Mr. . . . ., of Toronto, with our new process of butter making. It is giving very satisfactory results. We can guarantee 25% better returns, a simpler process, more certain in results, better butter, a purer butter, less casein and water, and better keeping.

"We work from 25% to 30% above the Babcock test. These advantages are important to you. We invite investigation and can refer you to. . . , who has kindly consented to your making any test you like, with either his cream or your own, and we suggest that you bring one week's cream of any cow you prefer, and that you have made previous test of, and see what our process will turn out, or any other test you may wish. We use no chemicals or foreign material. We sell nothing, but work on royalty. Shall be pleased to give you any further information.

"Yours truly,

" . . . . ."

At the same time we must not be too severe in our judgment of earlier churn records. Most of the cows are now dead and we have no other means of getting at their worth. Many of them were great cows. Just what records to discount and to what per cent can never be known. But the farce of making records of 30 lbs. and upwards is ended. The Babcock test is of wonderful accuracy yet simple in its operation. No valid objection can be raised against it. What shall we say then of those who would continue the old game of reporting churn tests? Be the records great or small, they are no longer worthy of attention, and it seems to me an insult to their readers for our papers to publish them. It is difficult to overvalue official records made with the Babcock test. Prof. Henry points out the reasons why in a single sentence: "By means of properly conducted official tests," he writes, "and the use of the Babcock test, the representatives of our various breeds of dairy cattle are in position to establish records which are reliable and in time will become immensely valuable, as the data accumulate and the effects of breeding and selection are realized."

GEORGE RICE.

Curries, Ont.



## THE DUAL-PURPOSE COW.

### No. 1.

ED. *Hoard's Dairyman*:—During the entire discussion of this question in the *Dairyman* since my first article sent to the *Breeder's Gazette* was reprinted in its columns, nothing has surprised me so much as the complete misapprehension of my position with reference to the same as expressed by the writers who have seen fit to criticise my views. And most of all have I been surprised that the editor of the *Dairyman* has fallen into the same mistake. I feel grateful, therefore, for the space now accorded to me, to enable me to put myself right with the readers of this excellent paper.

Read those criticisms carefully from first to last, and you will notice that they are all based upon the idea that I am the enemy of dairying and dairymen, because of my advocacy of the dual-purpose cow. No view could be more unfounded. I took particular pains to state my exact position on this point in the papers sent to the *Gazette*. Again and again have I put myself on record as being in favor of the straight dairyman having a dairy cow and no other, and of his improving her to the greatest possible extent. No man in the United States rejoices more than I do in the progress dairying has made during recent years, in the improvement that has been made in the dairy cow, and in the magnificent work that *Hoard's Dairyman* has done in this direction during recent years. It is my conviction that if this republic were to erect a monument to ex-Governor Hoard, great, high, and costly, after his translation to the better land, it would not then have cancelled the debt which it owes him. Is there anything in the view thus expressed that shows ill will to dairying or dairymen? I want to be fair. I hope all those who have criticized me can in the sight of God and man say the same.

The smoke of battle, therefore, has arisen from a part of the field around which there should have been no fighting. There is no difference of view between dairymen and the writer as to the mission of the straight dairy cow. The question is not will the dairy cow give more milk than the dual-purpose cow.

All the answers to the request of the editor for facts as to milk yields have been based on this assumption. I have all along conceded that the straight dairy cow would give more milk than the

dual-purpose cow. All of those letters to the *DAIRYMAN* which spoke of large milk yields simply confirmed what I had conceded from the first. And yet they were made to do duty against me not only by the writers, but by the editor of the *DAIRYMAN*. They were printed under the heading, "Facts versus Theory."

The question at issue has reference to the existence of the dual-purpose cow and the place that shall be assigned to her on the farm. The *DAIRYMAN* says she is not, that she is a myth. My contention is that she is, and that she is not a myth. The *DAIRYMAN* claims that she is a delusion and a snare, and that therefore no place should be accorded to her on the farm. My contention is, that she is not a delusion and a snare, and that she has an important mission to fulfill on many farms in this country. If I have mistated the position of the *DAIRYMAN* on this question, I hope the editor will correct me. I want to be fair.

And just here I may say that this question will have to be fought out, and within the next few years. It will not be settled by the *DAIRYMAN* saying that there is no such an existence as the dual-purpose cow, nor by my claiming that the opposite is true. It will be fought out on its merits in the experiment stations and on the farms. Men may rain ridicule on the head of the writer because of his views on this question, till they are wearied, but that will not settle the question. Like the soul of old John Brown, it will still go marching on toward settlement.

The time has come when there must be definite teaching on this question in our colleges. The breeds of live stock must needs be classified where teaching is to be sufficiently specific. As the question appears to the writer, cattle must be classified as beef and dairy; or as beef, dual-purpose and dairy. If the first classification is correct, the second must be incorrect and *vice versa*. In my book on "The Study of Breeds" I have adopted the three-fold classification, and so firmly am I convinced that this view is the correct one, that I am glad to have thus put myself on record. This book has been introduced as a text book into several of the foremost of the agricultural colleges. The professors who use it are going to accept or reject the classification. It is one of those questions that must be settled, and in the not distant future. The next decade will tell pretty certainly whether Hoard is right and Shaw is wrong, or whether Shaw is right and Hoard is wrong. And so con-

fidest do I feel as to what the outcome shall be that I am glad I am on record with reference to this great question.

Let me state my creed once again, that all possible misapprehension may be removed :

1. I believe in a straight dairy cow, and improved to the greatest extent to which improvement is possible without sacrificing constitution and stamina. Every man whose chief concern is dairying should have this cow. The dual-purpose cow is not for him.

2. I believe in a straight beef cow. The place for this cow is on the range, and on the large pastoral farms, where it is not practicable to milk cows by hand. The beef making properties of this cow should be improved to the greatest extent possible without injuring her breeding properties.

3. I believe in a dual-purpose cow, that is to say, a cow that when in milk will give a goodly quantity of the same, and that will fatten readily when dry. When this cow is properly mated she will produce a calf that will grow readily into meat. This cow, through a goodly performer, in both directions, will not give as much milk as the high type dairy cow, nor will she produce calves of the very highest type for beef. This cow should be kept on the arable farm, and by farmers who desire to sell their cream and also to grow more or less of beef from year to year.

4. I believe that this cow is not necessarily a sport, that is to say, a product of spontaneous variation, but that she can be produced with much certainty in consonance with the recognized laws of breeding.

5. I do not believe that it has yet been satisfactorily demonstrated that the average dairy cow, including her progeny has made more money for her owner than the dual purpose cow has made for her owner when the progeny is taken into the account.

These items of belief will be briefly enlarged upon in the two papers that are to follow.

THOMAS SHAW.

University of Minnesota.

## The Poultry-Yard.

### POULTRY CALENDAR FOR FEBRUARY.

Burn a pound of sulphur in each house the first day of the month so you will not forget it.

Clean up the droppings every morning.

Put coal oil on the roosts and nest boxes every week or two, and sprinkle liberally with insect powder.

Change the litter in the nest boxes every week or two, scald the drinking vessels once a week.

There is but little difference in the work for January and February. The same rules govern both months. In many localities February is considered the hardest month of the year, the weather being more variable and severe. If the fowls are comfortably quartered and cared for, these changes are easily met, and egg production will not be affected by them, but if the hens are obliged to rough it during these decided changes, there is very likely to be a great falling off in the yield of eggs. Generally speaking, hens that have been but ordinary layers during the past winter months, will now begin to shell out the eggs. Pullets too, that were late hatched and did not lay during the winter, will now begin, provided they have not been stunted during cold weather. Among the heavy winter layers there will be signs of broodiness, and if warm houses can be provided in which to set the hens and raise the young, those who are not using incubators can get out some early chicks for their own use. In Asiatics, hatches in February and March give desirable birds for fall showing; but for winter egg production it would be too early. The latter part of this month the ducks should begin laying. There will be probably but few eggs at first, but the start is usually made.

Take advantage of every nice day, and clean up about the farm. If fruits are raised with the poultry, this is the month to trim up shrubs and trees.

Keep the incubators hard at work, for chicks hatched this and next month will command good prices.

The demand for broilers improves this month. Eggs will average about the same price as last month, sometimes going five cents to ten cents higher than last month.

During this month, give the fowls and chicks



the sun of their yards when the weather is fine, but be sure that they are comfortable and well provided for in the house, so they will feel contented indoors during heavy wind, rain or snow-storms.

Keep a good lookout on the condition of the stock at this season.

If you have erred in feeding, there may be overfat or liver troubles, indigestion, or looseness of the bowels that must be remedied at once. Very often by making the fowls do more exercising, and changing the food to such kinds as will suit their conditions, sickness, so common in the early spring, will be avoided. Hens that have been backward in laying during the winter, and have been generously fed, are almost sure, as a rule, to be in too fat a condition. They will begin the laying season with soft thin shells, and often double yolked eggs. Pullets too will have the same trouble, and one cannot be too particular in properly growing up the stock for breeding purposes. When pullets are too fat they have great trouble to produce their first eggs. Use the limbs of trees which you have trimmed from orchard or garden, cut into short lengths for charring, and burn slowly in the old wood stove and make into charcoal enough to last you for a year; in fact it will pay you to sift out the charcoal from your wood ashes made in all the stoves in the house, and keep it in small boxes in the hen house where the birds can get it at any time of the year. It can be saved in granulated size or pulverized and mixed with the morning mash. It should be kept in covered tin cans, and is a valuable thing to use in the food for both fowls and chicks. It acts as a corrective in preventing diarrhæa and bowel complaints, keeping the contents of the crop sweet and free from acidity. Let February be a month of cleaning up and preparing for springwork. What can be done now will be considerable labor saved at a season when there is so much to do.

S. J. ANDRES.

#### **BUTTER AND EGGS CO-OPERATION IN FRANCE.**

A movement is on foot in France to attach an "Egg department" to their system of co-operative dairies. The plan is simple and works well. Each member of the Dairy Association undertakes to send not less than 200 eggs per week on two fixed days; a distinction is to be made between

eggs for consumption and those intended for hatching. Members can only send the product of their own hens and at their own expense to the creamery office. To secure that the eggs be in a fit and proper condition the members will bind themselves to remove the eggs daily from the nest, and leave as the nest-egg one of porcelain. There is a heavy penalty for sending old or spoiled eggs. The creameries undertake the sale of the eggs and secure the best market price. Associated with the egg industry that of poultry will be added later on.

This is extending the co-operative system in a practical way. If it were practicable to do the same work in connection with our co-operative cheese factories and creameries it would go a long way towards solving the problem of how to collect the eggs from the farmers in a perfectly fresh condition. Cold-storage facilities could be provided at the factories, where the eggs could be kept in a fresh condition and packed ready for shipment to the large cities or direct to Great Britain.

#### **THE PROPOSED AGRICULTURAL SCHOOL**

*Interview with the originator, Mr. John Corbett, Impney, Droitwich, England.*

Mr. John Corbett has attracted attention throughout all classes interested in the national industry by his munificent offer to found a School of Agriculture, and there is a natural and keen desire to obtain further information about the important scheme, and to learn as much as possible respecting the personality of the donor. On the first point, I had the privilege of paying a visit to Impney the other day, and am able to reproduce what Mr. Corbett himself says about it; while, as to the second, I can only repeat what I heard from other source.

Mr. Corbett has, however, long been known in Worcestershire, not only as one of the best of landlords, but also as one of the most successful of business men. He has the power, as well as the will, to be philanthropic, because of his energy, perseverance, and discernment, which, at the age of 82, are still quite unimpaired. Indeed, he much regrets that he is not now, as formerly, the proprietor of the Stoke Prior Salt Works, which, under his administration, eminently prospered for about 40 years. In 1852, when he courageously took over the works, after nine individual pro-

prietors and two joint stock companies had come to grief over them, the manufacture of Stoke amounted to about 26,000 tons a year. It was gradually increased by the establishment of agencies in all the British colonies, and most other parts of the world, to 200,000 tons, or an increase of more than 700 per cent., with a corresponding increase in the number of men employed, and a more than equivalent advance in the wages paid. Thus, while the item for wages in 1852 was between £40 and £50, in 1889 it varied from £500 to £700 per week. This remarkable result was due to the untiring vigilance and unswerving courage of the new proprietor, who, in order to be about the works with the earliest and latest of his men, slept over the offices, and lived in the business. In nine months he was satisfied that things were paying in the wright way, and in two years the works had been placed on the high road to the position with which the present generation is familiar.

If Mr. Corbett had not, nine years ago, sold to the Salt Union, the splendid property he built up, Droitwich might now have been a sea-port. But all the great improvements which have been made in the town are mainly due to him. He has converted it into a popular health resort. Knowing that the use of brine for the manufacture of salt in Droitwich must decline, he erected baths by way of compensation, and there are now in the town several first-class hotels, and many comfortable villas for the accommodation of visitors. For 20 years he represented the Droitwich division in the House of Commons, and he has been pressed to renew his connection with the constituency. As to how he is regarded by the working classes, it suffices to say that for upwards of 40 years he never, as an employer, had a strike of 48 hours. Perhaps that was because he paid his men about 15 per cent higher wages than prevailed elsewhere in the salt trade, provided them with good cottages and gardens, schools, a dispensary, a doctor, a chaplain, and even wine when they needed it. In another capacity, that of landowner, he is so considerate to his tenants that, if he has a farm to let, there is a rush for it from men who are anxious to enjoy the advantages of being "under Mr. Corbett."

Impney, which occupied several years in building, is superbly situated on the banks of the river Salwayre, and stands on an eminence commanding a charming view of typical Worcestershire scenery

and part of the county of Salop. Twenty-five years ago wheat and beans were cultivated on the site, and it must have been no easy matter to make the grounds worthy of the mansion. But they are as picturesque as the house is beautiful. It was in Mr. Corbett's pleasant sanctum that my courteous host chatted respecting the unique project which has attracted so much attention.

"When," I asked, "did you first conceive the idea of founding a School of Agriculture?"

"It had been on my mind for 20 years to do something to educate the rising generation in the technical or scientific means of agriculture. I do not pretend to be an expert, but it has often struck me that the land has not been made the most of, and I thought it would be better to do something while I was living."

"Did you consult anyone before you came to the decision?"

"Yes; I talked the matter over with Mr. Martin Curtler, of Worcester, and other gentlemen of considerable agricultural experience, and they recommended me to let them write to several large landed proprietors to see if they would support the proposal, not financially, but as an educational agency for improving farming. There have since been two meetings, at each of which the landed proprietors who were present, expressed themselves warmly in favour of the object, and freely recognised its importance."

"Has any detailed scheme been finally determined upon yet?"

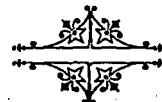
"No; at present the thing is quite in embryo. But, to put it roughly, I propose that a certain part of my Worcestershire estate, say about 200 acres, shall be apportioned for the purpose of an experimental farm, and that a building shall be erected with accommodation for 30 boarders, including separate bedrooms, for the sons of tenant farmers. It is my aim to do here what the State does in Germany.

"What kind of staff do you suggest?"

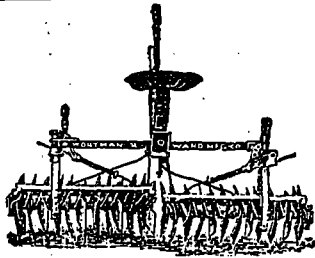
"An agricultural superintendent and secretary, a matron, and a bailiff would, I think, be sufficient, with necessary labourers, to form the staff."

"You considered, I believe, whether it would be more desirable to form a college or a school?"

*To be continued.*







## THE Only Spade Harrow.

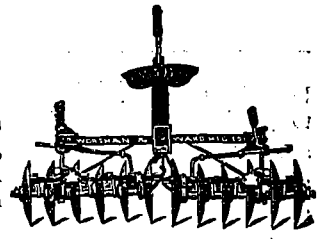
It Has Ball-Bearings

The best IMPLEMENT ON EARTH for pulverizing hard ground. A splendid record made in the Province of Quebec in 1898. Now for 1899.

## Ball-Bearing Disc Harrow

EQUAL TO THE BEST

The Coil Pressure Springs on both Disc and Spade, excel in merit and in power anything used in their stead.



Other goods we manufacture:—"Daisy" Churns, Washers, Grain Grinders, Root Pulpers, Corn Scufflers, Tread-Powers, Hay Forks and Slings, Wagon Skeins, and Pumps. We also sell the Milner Walker Wagon, and Percival Plows.

# The Wortman & Ward M'g Co.

LONDON, ONT.

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Eastern Branch: 60 McGill St., Montreal, Que.

## Nichols Chemical Coy's Fertilizers

CAPLETON,  
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Put up in 100 lbs.  
Bags address as  
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*RELIANCE, ROYAL CANADIAN, CAPLETON, and  
"VICTOR" brands suitable for all sorts of Crops,  
specially good for tobacco and Rootcrops.*

Every bag warranted up to government standard. 10,000 are using "Victor Brand." Will you? It will pay you if you do so?

**R. J. LATIMER, 146 McGill St., MONTREAL.**

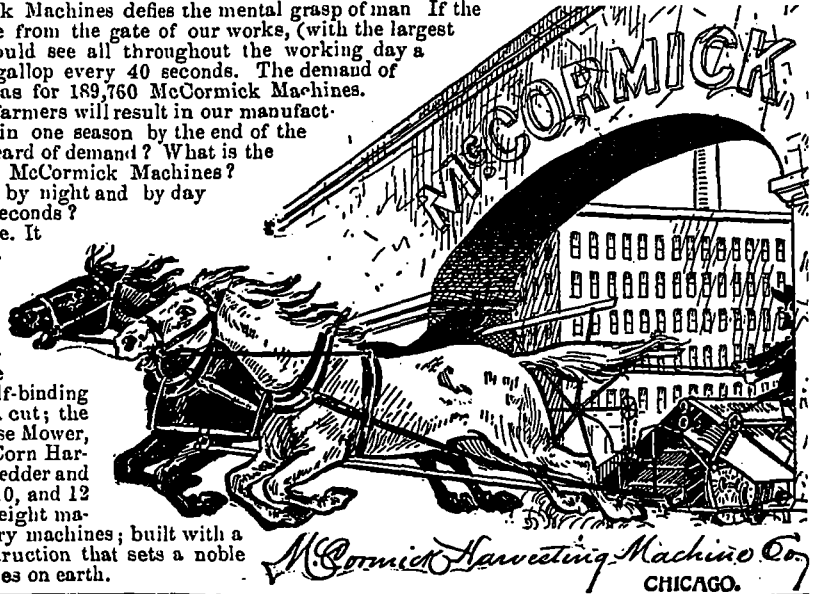
We want an energetic man in your locality to sell our goods. Be the line in the market. If you are a pusher and want employment, we can suit you. *Big profits.* Drop us a Card for particulars.

**Imperial Company, Galt, Ont.**

**For Sale.** Sows Grand Yorkshire Improved; many swines which will farrow in February, March and April. Address BENJAMIN VINET, Rang Double, BEAUHARNOIS, Que.

**Dr. HAYES, Buffalo, N.Y. ASTHMA Cured to Stay Cured**

The enormous output of McCormick Machines defies the mental grasp of man. If the machines we manufacture were to issue from the gate of our works, (with the largest output in the world) the spectator would see all throughout the working day a McCormick Machine emerging at full gallop every 40 seconds. The demand of the farmers in the past season of 1898 was for 189,760 McCormick Machines. This continuing tremendous call of the farmers will result in our manufacturing and selling still larger numbers in one season by the end of the century. What is the cause of this unheard of demand? What is the reason of the everlasting popularity of McCormick Machines? Why are we forced to run our Works by night and by day up to the output of a machine every 40 seconds? The cause is plain. The answer is simple. It is The Building of the Best in the World. Almost seventy seasons of success have elapsed since Cyrus H. McCormick invented the Reaper in 1831. In all that time the McCormick has been The Best Built Machine in the world. The McCormick Machines for 1899 are the best in the World. The McCormick Right Hand Self-binding Harvester; the New 4 Mower 4½ and 5 ft. cut; the Big 4 Mower 6 ft and 7 ft. cut; the One horse Mower, 3½ and 4 ft. cut; the Folding Daisy; the Corn Harvester; the Corn Husker and Podder Shredder and the Hand and Self-dump Hay Rakes 8, 10, and 12 ft. are The Best in the World. All these eight machines are McCormick End of the Century machines; built with a brilliance of invention and honor in construction that sets a noble standard to all other agricultural machines on earth.



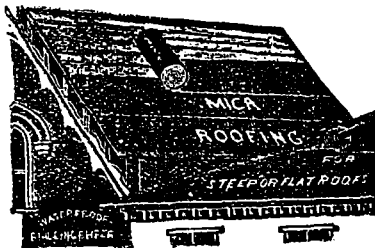
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Specialty: Importation of seeds for Agricultural Clubs, Grain, Clover and Lens Seeds, &c. Corn, wheat, barley, peas, &c. Chemical manures.

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