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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

VOL. 2. No. 18 — This Journal replaces the former "Journal of Agriculture," and is delivered free to all members of Farmers' Clubs. — MARCH 15, 1899

THE

Journal of Agriculture and Horticulture

THE JOURNAL OF AGRICULTURE AND HORTICULTURE is the official organ of the Council of Agriculture of the Province of Quebec. It is issued Bi-monthly and is designed to include not only in name, but in fact, anything concerned with Agriculture and Stock-Raising, Horticulture &c. All matters relating to the reading columns of the Journal must be addressed to Arthur R. Jenner Fust, Editor of the JOURNAL OF AGRICULTURE AND HORTICULTURE, 4 Lincoln Avenue, Montreal. For RATES of advertisements, etc., address the Publishers

LA PATRIE PUBLISHING CO.,
77, 79 & 81 St. James St., Montreal.

Subscription: $1.00 per Annum payable in advance.

Table of Contents

Notes by the Way.

PROF. SHUTT ON BARNYARD MANURE.

(Continued.)

According to trustworthy experiments, the amount of manure yielded by well-fed, well-bedded animals, per annum, is about as follows:

A horse, during the 5 or 6 months he is in the stable	5 to 6 tons.
A 1,000 lb. steer	20 "
A pig	2 to 3 "
A 60 lb. sheep	1,520 lbs.

The value of the above, calculated from the constituents at market prices, on a basis of 1,000 lbs. live weight.

Sheep	$26.09
Pigs	60.88
Cows	29.27
Horses	27.74

(Of course, from the careless way in which manure is usually treated, that is to say, in four farms out of five, such returns are rarely, if ever, realised).

Poultry manure is rich, but not "equal to Peruvian guano," as some wild theorists used to state in the Poultry-papers. Good guano samples used to contain 14 per cent. of nitrogen, (1) whereas Prof. Shutt gives the contents of poultry manure in nitrogen as from .8 to 2.0 lbs., and its value from $5.00 to $8.50 a ton.

Hen manure ferments quickly, and will soon lose much of its nitrogen unless it is preserved

(1) Worth, at present prices, $39.20 a ton. ED.

by absorbents, such as dry mould, road-dust, peats, etc. Its value, as in the case of cattle, depends greatly on the food eaten.

The fermentation of manure is brought about by the action of *bacteria*, microscopic plants. Fermentation always entails a loss of organic matter; part of the nitrogen escapes. The looser the pile, the greater the loss. Therefore, keep the mixen moderately moist and closely packed, and cover it, when completed, with 9 or 10 inches of heavy soil.

Apply manure, if free from weed-seeds, in a recent state to heavy land; to light land give rotted manure. The reasons for this difference are obvious to any practical farmer.

Our own practice has always been to cart the manure over the heap; the horses and cart-wheels press it down tight enough; spread the dung level all over, load by load, trimming up the sides, as the height increases, till it is four feet high, when the earth should be spread on the top, as above.

A moderate heat will be generated in the mixen; in ten days or a fortnight before it is required for use, turn it carefully breaking up all lumps, and throwing the outside into the middle. The time for turning, of course, depends upon the weather.

Thus treated, the seeds of most weeds will be killed; as Mr. Shutt admits in his evidence before the House; and no very great loss of manurial constituents will be incurred.

In the year 1884, at Sorel, after we had nearly finished manuring a piece of land for potatoes, our dung, prepared as above, ran short by about two loads. We sent into the village for some, and put it into the drills as it came on to the farm. If any admirer of "recent manure" had seen the difference in the quantity of weeds in the two parts of the piece when vegetation showed itself, we think he would have been converted. (1)

Top-dressing on clovers, meadows, etc., a constant practice in Britain, is, or rather has been, a good deal cried down here. The question, often asked, is: does manure spread, and allowed to dry upon the field, lose any of its nitrogen? The answer is: in manure, so treated, fermentation is at once arrested. The following test was applied to manure, in two different conditions, at the Ottawa experiment-farm, in 1892:

LOSS OF NITROGEN IN FARM-YARD MANURE BY DRYING OUT IN THIN LAYERS.

No.	Manure.	Per cent.	Amount per ton in lbs.	P. c. lost on exposure.	Value at 17c. per lb.
1	Well rotted; after fermentation. { Before exposure.....	·516	10·3	.....	$1 76
	{ After "	·505	10·1	·01	1 72
2	Rotting; during fermentation. { Before exposure.....	·490	9·8	.....	1 67
	{ After "	·466	9·3	·024	1 58

But, it must be remembered, this by no means does away with the necessity of taking care in what situation dung is spread. We have seen a wide area, on by no means hilly land, covered by a slowly moving inundation of water from melting snow; and that this did not leave much goodness behind in the top-dressing of the previous autumn we may be sure.

Lastly, remember that light land does best with frequently repeated smallish dressings; heavy land, being more retentive may receive a greater quantity at wider intervals of time.

INJURIOUS INSECTS.

(*Continued*).

In our lectures, we also took upon ourselves to remind farmers of the reciprocal duties they owe to one another, especially as regards the destruction of the insects that prey upon orchards, crops, etc.

(1) The first lot of dung was derived from the same source as the second, so there is no argument to be founded on the assertion that perhaps the second lot was full of weed-seeds and the first lot free from them. ED.

It would be well to put into practice here that which is done in other countries, namely to induce municipalities to exert a more active superintendence, and to take means to preserve the fruits of our praise-worthy efforts.

To bring forward only one example: we see about the country, here and there, the planting of a few productive orchards; but of what good will they be unless regular care is taken of them? What can a few progressive men do in the midst of so many careless men?

Still, it must be confessed that our exports of fruit are already considerable, and that they may easily be doubled.

A more strict exertion of the powers of the law would, in this case, be a service rendered to the public.

TOBACCO-GROWING.

This crop, though of no great use, has doubled its yield this year.

We saw superb fields of it that only required skilful treatment.

The importation of tobacco is so large, that the farmers of the country have taken to grow a great deal of it, and, consequently, we had to answer numerous questions as to the best method of preparing it, etc., etc.; so we think it would be well to institute experiments on new varieties to find out which kind is the best suited to the demands of the market.

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

(*To be continued*).

THE PROPOSED AGRICULTURAL SCHOOL.

(*Continued*).

"I did; and I came to the conclusion that a school would be much better than a college. The farmers, for whose benefit the institution is entirely intended, would be frightened away by the use of the word 'college.' My idea is that directly the sons of farmers leave school, they should be able to enter the agricultural school as pupils; and I believe the committee which has been formed as the first governing body in connection with the scheme, coincide with me."

"May I enquire the names of the members of the committee?"

"It consists of Lords Coventry, Beauchamp, Cobham, and Windsor, Sir H. F. Vernon, Messrs. J. W. Willis Bund, Robert Woodward, James Best, E. Vincent Wheeler, John Brinton, Colonel Norbury, Frederick Corbett, and Ernest Bomford."

"And the age of the pupils?"

"From 15 to 18. As to fees, it is proposed that the fee shall be £5 a term, or £15 a year, to include board and lodging; and that the term of studing shall be at least two years."

"That is to say, the cost to the farmer will be considerably less than the expense of keeping his son at home?"

"One of the objects is to afford him financial relief in that direction, as well as to instruct his son in the business to which he intends to apply himself. I may say that I put the fees at £12 a year, but the committee tought that £15 would be better."

"What are to be conditions of admission to the School?"

"The pupils must be the sons of farmers in the counties of Worcester, Salop, and Hereford, preference being given to those whose fathers are farming in Worcestershire. As to the examination, the superintendent might examine respecting the moral character of the candidates."

"Will there be any religious test?"

"None whatever. It will be only necessary that those who seek admission should profess a religion which contains the elements of Christianity. The sons of members of the Church of England and Dissenters, will be equally eligible."

"Will the school be limited to boarders?"

"That is a point which has not yet been quite settled, but it has been suggested that the sons of tenant farmers, resident in the neighbourhood, might be admitted on reduced terms, attending daily and going home every night."

"I presume there will be a Board of Management?"

"Yes—of ten or a dozen gentlemen."

"Can you indicate the scope of the studies?"

"They will, in the first place, embrace the management and cultivation of the soil. There are are two or three different kinds of soil in that part of the land which I propose to devote to the purpose. Then, there is a breeding and rearing of all kinds of stock; practical, though elementary, veterinary science, including shœmaking, rough carpentering and weel-wrighting; fruit-growing and pruning; bee-keeping; poultry-

raising and hop cultivation, if the pupils wish"

"Is it proposed to hold examinations?"

"Yes, annually; and if the funds permit, there will be exhibitions to meritorious scholars, tenable tor two years."

"Have you decided upon the sum which you consider will be enough to defray the cost of building?"

"I propose to divide the sum of £50,000 in all, to include buildings, land, and endowment. The endowment fund is to be invested in the names of the trustees of 'The John Corbett School of Agriculture for the sons of tenant farmers in the counties of Worcester, Salop, (1) and Hereford.' The trustees are about to be appointed."

Passing on to general questions, I inquired of Mr. Corbett the extent of his interest in land.

"In Worcestershire I own about 6,000 acres; in Merionethshire, between 4,000 and 5,000; and I have also a small estate in Shropshire."

"Has the depression been badly felt here?"

"Not so badly as in some other parts of the country. I think this also applies to some parts of Wales."

"Have you any difficulty in letting farms?"

"None whatever. I notice, however, that as soon as I buy a farm anywhere, I am asked for a reduction of rent."

"How do the farms on the Worcestershire estate vary in size?"

"They run from 50 up to 350 acres. A nice quantity of fruit is grown on some of them. In fact, the fruit is often a material help towards paying the rent. On one of the larger farms, about 230 acres, over 40 hogsheads of cider have been made in a season."

"Is the estate chiefly arable?"

"About two-thirds of the land is arable, and the remainder pasture. There is some very good land near Droitwich. There is very little light land on the estate. Wheat and beans thrive as a rule. A good deal of the land has been laid down to permanent pasture during the last few years, and some of it is getting into a very fair turf."

"Do you think that farmers suffer from the lack of capital?"

"There is no doubt about it. A man cannot work a farm to the best advantage for less than £10 an acre. Yet some farmers try to do it on less than £5. Then they are obliged to sell their crops prematurely, owing to shortness of money."

Mr. Corbett's agent, Mr. Hall, who joined in a portion of the interview; confirmed this opinion; and I learned from him that Mr. Corbett provides a Shire bred stallion, "Banker 5," for his tenants, who get some excellent stock from him, both in England and Wales. The best farmers say that he has wonderfully improved the stamp of cart horses in the neighbourhood of Droitwich; and at the last Merionethshire Show, at Towyn, all the first and second prizes for colts and fillies, of the three-year-old class, were won by his progeny.

Then the conversation turned on the labour question, which Mr. Corbett considers is becoming more serious. "None of the boys now growing up," he said, "seem to take any interest in the land as formerly. Yet agricultural labourers are much better off now than when the farmers were making money. Then they had 12s. a week, and a wretched hovel to live in. Now the standard wages are 14s. to 15s., while the carter gets from 18s. to £1 per week; and excellent cottages are provided."

"You attach importance to cottages?"

"Great importance. At Stoke works I built a small town of cottages with gardens, and I am replacing the old ones with new on many parts of the estate. But even the higher wages and the good cottages do not suffice to attract the young man to the land. On one of the farms there are two very good cottages empty, owing to the tenant of the farm being unable to get suitable labourers to put in them."

Knowing that Mr. Corbett built some almshouses near Droitwich, and is much concerned to provide for the deserving poor in their old age, I asked him whether he had anything to say about old-age pensions.

"I think," he replied "that it is possible to frame a scheme of a practical character. But it must be a compound question between masters and men. The men are too independent to care about everything being done for them. It is a difficult question."

"And as to the prospects of farming generally?"

"There is no question that they are improving. We have seen the worst of the bad times. The wet seasons take a great deal of richness out of the soil; but the dry weather of the last few summer

(1) *Salop* is another name from the county of Shropshire; Shrewsbury, the capital town's name, is an English corruption of the Anglo-Saxon *Scrobbes-byrig*, i. e., Shrubborough. The Normans corrupted or softened this into *Sloppesbury*, whence came *Salop*. Ed.

has been very beneficial, and the crops have been much more satisfactory."

The hospital at Stourbridge with park and appendages, was purchased and mainly endowed by Mr. Corbett. It is a somewhat ancient building, and historical, as having been the residence of the family of Samuel Rogers, the poet. It has beds for about 40 patients, and is a great blessing to the poor of neighbourhood.

Before I left Impney, Mr. Corbett told me something of the work he is doing on his estate in Merionethshire, and of his hopes of seeing Towyn develop into one of finest watering places in Wales.

My glimpse of Towyn in the summer, was quite enough to assure me that it has a brilliant future before it, and, with Mr. Corbett's permission, I may, on another occasion, be able to show how he is playing the part of Fairy Godfather in the Principality. ALFRED WILCOX.

An ancestor of the present Mr. Corbett, of the Sundorne Castle, bet that his leg was the handsomest in England, and won the wager. This was in, or about, 1765, when the "Swells" in London were mad about betting. ED.

The Farm.

RAPE GROWING

We have received several enquiries lately regarding rape growing. As the cultivation of this plant is year by year receiving more attention in Ontario we asked Mr. John I. Hobson, Guelph, to prepare an article for publication on the subject. Mr. Hobson writes us as follows :

"It is very noticeable that, with few exceptions, the most successful farmers in the country are men who follow stock-keeping largely in some of its forms. In fact, so noticeable is this, that we may well be led to the conclusion that on the ordinary soils of this province stock-keeping is the basis of good farming, that a farmer's success will depend a good deal on the quantity of dairy produce or meat per acre his farm is made to produce. As a means in that direction the growing of rape and feeding it off on the land has been found by many of our farmers to be followed by highly satisfactory results. It has been grown extensively in the Guelph district for many years, and thousands of lambs fattened on it have annually been sent to the American markets, yet I have found, when travelling in other parts of the province, that it is quite exceptional to see it grown to any considerable extent. It is a little surprising that such should be the case, for there is no question that those farmers engaged in growing it have made a good deal of money for years past in sending their lambs in prime condition to the Buffalo market, and it has been found to be no small factor in keeping their farms in a good state of fertility.

"I would say to the farmer who has never grown a crop of rape that he would be acting wisely to go into it in a small way at first, and prove by his own practice and observation whether the conditions in which he is placed are suitable to its production, and to find out for himself many little things that can be learned best by experience.

"The system which is generally followed by those who have grown it successfully is to prepare the land just as is done for the turnip crop. Taking it for granted that one of the objects in growing it be a cleaning crop, then it follows that if the land is pretty well worked the fall before, a good many thistles and weeds will have been got rid of and so much less work will be required in the way of hand-hoeing the next season. The last plowing should be done deeply, or if the land is inclined to be stiff, plowing in what is termed ridge and furrow—that is putting it into drills—is an excellent plan. I have found in my own practice that it answers a good purpose, the winter's frost making it more friable when work the following summer. An important matter is to have the land in fine tilth when sown.

As to the soil best suitable for growing rape, a fair crop can be grown on almost every variety if properly prepared. I have some acres of sandy land, it is what may be called a poor leaching soil; some of the finest crops of rape ever grown on the farm were on these fields. It was sown thinly, with about three-quarters of a pound of seed to the acre, and top-dressed when the plants were into broad leaf with two hundered pounds of gypsum to the acre. My general practice of late years has been to grow it on land at the end of the course and apply a small quantity of manure, about seven or eight loads to the acre.

The time of sowing may be any time from about the 20th of June to the middle of July. I prefer the last week of June if the land is in good condition and the weather favorable. The drills shou

be from twenty-seven to thirty inches apart, the latter width is preferable if the land is very rich and likely to produce a heavy growth.

A good deal has been said about whether rape should be sown on the flat or on raised drills. It appears to me that as a general plan it is so much the better to sow on raised drills that it is not worth discussing. Of course one can theorize and prove to his own satisfaction that the contrary is the right plan to follow, but the fact remains that the cencensus of opinion of nearly every farmer that I have met who has grown it successfully is opposed to growing it on the flat. The only objection to a raised drill is that there is more danger of the sheep and lambs getting on their back and not being able to get up. For the first few years in my own experience a good many were lost in that way ; but I soon found that close attention was necessary to keep down to a minimum the percentage of loss.

Coming to the question of sowing, if the seed is fresh and good, and the land well prepared, from one to one and a quarter pounds to the acre is ample. (1) It is a great mistake to sow thick. To obtain a full and well grown crop it requires room for the plant to grow large and high. I mean by a good crop one that when a flock of lambs is turned in they will be about covered with the plants; (2) and it is quite a mistake to think that the strong and thick stalks of the rape plant are not quite as nutritious as the leaves. At all events, if a chemical analysis were to show the contrary, practical results would then be at variance with science.

The after-working should consist of a free use of scuffler as long as there is room to work between the rows, and it is here where comes in one of the advantages of raised drills, the work of house hoeing being so much more readily done. If the drills have been carefully made of uniform width, the scuffler can so set as to hoe close up to the plants, and than the work of hand hoeing, if it is done (and it certainly should be if the best results are to be obtained,) is a comparatively light affair, just cutting away any weeds or thistles that may be amongst the plants. By a free use of the land be left as clean as after a first-class summer-follow, but the weight of the crop will be much increased.

In regard to the value of rope as a late fall feed, there are no two opinions as to its being the best crap grown for fattening shed and lambs, but there is some difference of opinion as to its value for feeding cattle ; not but what it is well understood that flesh can be laid on at less cost and more rapidly than by the use of any other feed that is fed off directly in the field, but the experience of many growers is that it is rather risky. Without advising as to its use for cattle, all I can say is this, that having grown it somewhat extensively for over twenty years I have found it a very cheap and satisfactory fall feed for cattle, and pigs do remarkably well upon it when they receive a small allowance of grain. During the many years we have grown it there has been the loss of only two calves, one of them clearly the of mismanagement in turning on with an empty stomach. With regard to either cattle or sheep, great care should be exercised to see that before being allowed to feed on rape they have been well fed beforehand. My own practice is to have a grass field adjoining to which the stock can have free access at all times, and when once put on the rape leave them their until the weather gets cold and rough in the late fall, when it is necessary to house at nights. When taken off in this way it is very important to see that they are well fed in the morning. Much of the trouble and loss which does occasionnly happen in feeding rape is mainly attributable to not exercising a little common sense in these matters of detail.

A well-grown crop of rape should carry from ten to twelve lambs to the acre for eight or ten weeks, or, say, from about the 20th September to the end of November. Some feeders consider it a good plan to feed a small quantity of grain when in the field. My own experience leads me to think that there is no profit or advantage in doing so unless or special reasons—such as being alittle over-stockke, or when meat is high and oats and bran very cheap.

All good feeders know that the lambs should become accustomed to eat grain before being changed from the fields to the yards, and for the same reason it is always well to mix a little turnip seed when sowing. If attention is paid to these things very little shrinkage will occur when put on to changed feed.

Mr. Donaldson, of the county of Oxford, one of the very best farmers and stock managers in Ontario, always feeds oats to his lambs when on rape, commencing with a small quantity increasing un-

(1) 5 or 6 pounds, *broadcast*, is better. Ed.

(2) In England, we have grown rape as "high as the hurdles," as the term is there, i. e , 3 ft. 8 in. Ed.

til they get one pint per day to each lamb. In that way he fattens from fifteen to eighteen lambs to the acre, with an average increase of weight of from twenty-five to thirty pounds per head in ten weeks. In this way he always turns off a splendid lot every year, bringing the very highest price going.

Mr. Laidlaw, another very extensive and intelligent feeder in South Wellington, has had single lambs increase forty and even as high as fifty pounds in seventy days when on rape.

One of my own flocks of purchased lambs was put on at an average of ninety-eight pounds; was fed for sixty-three days, and weighed, when delivered in Guelph, 121¼ pounds. However, a fair average flock of 200 good lambs would gain from twenty to twenty-five pounds in seventy days.

Care should be exercised, before the nights get frosty, to have the lambs closeley trimmed. They do not thrive so well when hanging with dirt; the buyers do not like it, and the farmer shows himself to be careless and slovenly.

In regard to the after use of the land, it is needless to say that, if the preparation for the crop and its after management has been what it should be, the land will be quite as clean as after a first-class summer follow, with the advantage of having received $10 to $20 an acre (in some cases considerably more) in the increased value of the stock from the market, which is usually, in this section, between the 5th and 15th of December. Besides this, the land has received all the benefit of the manure without even the expense of drawing and spreading; this is a good preparation for next year's crop.

SELECTION OF SEEDS.

The yield of a crop depends in a large measure not only on the degree of tilth and the wealth of the soil, but also on the quality of the seed. This is a question which farmers are too much inclined to overlook. It matters little how carefully the soil has been prepared: if the seed which it receives is deficient no satisfactory results can be expected. Often, the failure of a crop can be traced to seeds which through age or unsoundness lacked in germinative powers. Differences in maturity, size, weight and plumpness of the seed will also bring about large differences in the yield of a crop. These minor points bear more importance than is generally supposed. A few striking results, obtained from experiments conducted at the Ontario Agricultural College, to determine the comparative value of seeds, will help us to understand the necessity of selecting them.

These experiments have been carried on for a certain number of years in order to ascertain to what extent the yield of a crop was affected by size, weight, soundness and maturity of the seed.

Maturity.—Experiments extending over a period of 3 years have shown that seed obtained from very ripe wheat gives a larger yield that seed coming from wheat cut at an earlier stage of maturity. However, nothing definite can be said on this subject before experiments have been conducted long enough to clear away any doubt.

Size and Weight.—Long continued and careful tests, covering several years have been made with seeds of diff-rent size and weight. These seeds were not only sown in boxes in the laboratory, but also in rows in the field and in large field plots. 4 classes of grain: Oats, Barley, Spring Wheat, and pease were tested in this manner. Large plump seeds gave as an average 5.3 bushels more per acre than small plump seeds. This amount—average of results obtained during 5 years of experiments—is quite sufficent to make a marked difference in the profit from an ordinary field of grain or pulse.

The yield of root crops is also greatly influenced by the size and weight of the seed. Large plump seed of mangels, carrots, turnips, gave an average of 27 tons per acre, during 4 years—medium plump seed gave 23.7—and small plump seed 14.6 tons. Little attention is usually paid by the farmer to the size of the root-seed; but these striking results clearly show that neglect in this case is dearly paid for. The crop producer is not looking after his own interest unless he sows nothing but large, plump seeds on his farm.

Plump and Shrunken seeds also give widely different results. The increase in yield from the former was 23% over the latter.

Duration of Vitality.—The great majority of our agricultural seeds are affected by age; very few keep their germinative power over a few years. These facts have been proved by numerous experiments conducted in Germany and in the U. S. It has been found that, from seed of 3 years of age, only about ¾ of the Oats, ½ of the corn, millet, wheat and barley, and practically none of the rye would grow. At the end of 8 years only ⅛ of the

oats germinated ; wheat and barley were utterly useless as seed. Grass and clover seed deteriorate very rapidly with age, and generally are not worth sowing after two years of age.

These results clearly enforce the necessity for the farmer to buy only seeds which are guaranteed, and, for greater safety, to test samples before purchasing.

Weevilly Peas and Beans.—Peas and beans are often injured by an insect which deposits its eggs while the pod is forming. The larvæ, as soon as hatched, bores into the pods, and works into the peas, leaving however the germs untouched. The insect perfects when the pea is subject to heat after ripening. Great differences of opinion exist as to the value of the seeds. Seedmen often pretend that the germinative power of weevilly peas is as great as of sound peas. These statements are entirely misleading. Experiments have proved that only one-fourth the number of weevilly peas will grow, and the plants produced by such are usually weak and unprofitable. Beans gave the same results.

Broken and Split Seed.—Grains is frequently broken in the process of threshing and considerable amounts of broken barley, wheat and split peas are often noticed in seed offered for sale. Careful experiments conducted for several years on the comparative value of sound and broken seed have given the following results :—

Yield from sound peas	29.3 b.	per acre
" from split peas	9.8 b.	"
Yield from sound barley	42.7 b.	"
" from broken barley	34.2 b.	"

This difference in the yield is notable enough to induce the farmer to separate all broken grain from sound seed before sowing.

The *depth of planting* also influences a great deal the germination of the seed. Experiments have been conducted at the Ontario Agricultural College by planting the seeds of each of six different crops to the depth of one inch, two, three and four inches in the soil. In every instance the shallowest planting gave the best results with the single exception of corn which gave the equal results from the planting of 1 to 2 inches deep. In averaging the 5 classes of roots we find that those planted to the depth of 1 inch yielded 30.3 tons ; 2 inches, 28.7 tons ; 3 inches, 10 tons and 4 inches 3.5 tons.

CHAS. MORTUREUX.

LATENT FERTILITY IN THE SOIL

There is no more important question before the farmers of Canada to-day than that of maintaining and keeping up the fertility of the soil. The success of all farming operations depends upon it. Whether the farmer's specialty is live stock, dairying or grain-growing he cannot make a success of and one of them unless he gives special attention to maintaining the fertility of his land and making it as productive as possible. Too many farmers overlook this fact and condemn a certain line of farming as being an unsuccessful one to follow without getting at the very root of the cause of failure, viz, the condition of fertility in the soil. The question of fertility is becoming of more vital importance to the farmers of Canada every year. Unless they give it first place in their farming operations the outlook for Canadian agriculture is not a very bright one. We have a country lavishly endowed with the elements that should go to make its soil productive. There are latent forces in the soil and atmosphere which, if the farmer knew how to control and utilize them, would make his farm much more productive than it now is.

In the December number of the *Industrialist* Mr. R. W. Clothier discusses the latent fertility of the soil. He states that farms do "run out" from long-continued usage and improper treatment, but adds that in the majority of cases a very small per cent. of their natural fertility has been taken away in the form of crops. By far the greater portion has been wasted by improper method of cultivation. To quote :

"A very small per cent. of the total weight of plants is furnished by the minerals of the soil ; and of this small per cent. the following elements are necessary to plant-growth : iron, sulfur, nitrogen, phosphorus, potassium, calcium, sodium, silicon, oxygen, and chlorin. Of these, all but potassium, phosphorus, and nitrogen are present in the soil in such abundance as to be practically inexhaustible. The amount of these three elements, then, contained in a soil will determine its fertility ; and, since all of them may be considered of equal importance to plant-growth, a deficiency in any one of them makes the soil poor."

Taking Kansas soil as an example, the writer goes on to show that it contains 6,660 pounds of nitrogen to the acre to the depth of one foot. For an ideal crop of wheat 59.46 pounds of nitrogen per acre is required for both grain and straw.

According to this an ideal crop of wheat could be grown yearly for 70 years before the supp'y of nitrogen would be exhausted. By the same cropping the phosphoric acid would last 115 years and the potash 200 years. But these represent the fertility in only the first foot of soil. Many of the roots penetrate below this depth, and, as the rain annually brings down to the soil from six to ten pounds per acre of nitrogen, it would seem that the fertility of the soil is practically inexhaustible. But the writer recognizes the fact that soils do wear out, and explains it as follows :

In the first place, only a small portion of this plant-food is ever available to the plant at any one time. Nearly all the nitrogen, for example, exists in the form of organic matter, which cannot be used until it undergoes the process of nitrification, the process by which the nitrogen of organic matter is converted into nitric acid and nitrates. Nitrification takes place by means of bacteria, which live in the soil. In order that these bacteria may thrive and perform their work well, they must have conditions of warmth and moisture, must be supplied with oxygen, and the acid formed must be removed or combined with some base. Quite often a base easily acted upon is not present and too much free acid accumulates. Then, too, in watterlogged soils the temperature remains too low and the air is excluded by the water. We must find some way to supply these necessary conditions.

But there might be plenty of available nitrogen and the soil fail to produce well on account of a deficiency in available potash or phosphoric acid. These elements exist in the soil in nearly or quite insoluble compounds ; the potash in combination with other elements form double silicates, while the phosphoric acid is in combination with various bases which form insoluble phosphates. They may be liberated from these compounds and brought into solution by means of humic acids formed by the humus of the soil, by means of water holding in solution other salts, and by the action of the fibrous roots of plants. But, under the most favorable conditions, it has been estimated that less than one per cent. of these elements could be brought into solution in one year's time; and when once once brought into solution their tendency is soon again to form insoluble compounds. Granting, however, that an abundance of these three elements exists in available form, soils may fail to produce because they lack the necessary water to carry this food to and into the plants. The chief means by which these difficulties may be overcome is good tillage. There is no other way by which so much plant-foot can be liberated as by thoroughly pulverizing the soil :

Good tillage loosens the soil and allows free circulation of air. It may often aid in hastening evaporation for a time, and it also allows the sun's rays to have more power on cold "soggy" soils. As above stated, all of these conditions promote nitrification. Thorough tillage reduces the soil to fine particles, upon which water and humic acids may act more readily, and by breaking the surface crust, which always forms on untilled soil, makes more room and better conditions for the development of fibrous roots. It is a well-known fact that roots grown in a hard, crusty soil do not have as many fibres (which are the chief feeders of the plant) as those grown in soil or looser texture. It is also true that, though our cropping-plants send many of their roots to a greater depth, the major part of their feeding is done near the surface. These facts suggest that good plowing is one of the most essential features of good tillage.

Farming.

A LAST WORD ON APPLYING MANURE.

Although there may be some cases where the land is very level and where circumstances are such that the only way to manure may be during the winter, such instances in my opinion are very rare. My experience has covered many different kinds of soil and in different states. I have known of many cases where large coats of manure plowed under in a careless manner were, during dry seasons, a detriment to the crop, but when the work was properly done I never knew of any harm coming from the practice. The main reason why manure should be put into the soil and thoroughly mixed with it, is that it adds all the humus directly to the land.

In reply to W. J. Bradt, I would say that the principle applies as well to sandy or gravelly soils as to clay, and in fact my last six years' experience has been with the light, sandy soils of central Wisconsin, and I would venture to say that there is a loss of 20 per cent of the value of eight out of every ten loads of manure ever spread upon frozen ground unless the land be an absolute dead level. The best farmers keep their manure either in manure cellars under their barns or in

sheds built erpecially for the purpose of protecting this most valuable of farm products. If for any reason it is impossible to spread manure in the spring, keep it under cover and apply in the fall, plowing under when damp, if possible, as the decomposition will commence at once. The surface of soil begins to thaw out first, and if covered with manure, and thawing weather commences with rains, the manure may thaw out and half its value be washed away before the land becomes thawed enough to absorb the dissolved ferfility.

THE IDEAL FARMER.

From the "Texas Farm and Ranche."

The difference between the leader of an orchestra and the man who plays second fiddle, is that one loves his business and the other only his weekly stipend; one works for fame and the o her for bread. The man who saws catgut, or saws wood, and is not in love with his business, never rises above the condition of a common laborer. Enthusiasm is necessary to success in every field of effort. No man can become an ideal farmer who does not love farming, and especially his own farm. It is not necessary that a woman be both beautiful and rich to inspire love in the heart of her husband. The same may be truthfully said of the ties that exist between the farm and the farmer. A man may love his wife because she is his wife; so a farmer should love his farm because it is his farm, and is and will be what he makes it. Whatever its physical features, it can be made lovely in the eye of him whom it nourishes and shelters; and it is equally true that when love does not exist, there will be neglect and dissatisfaction, whether between man and wife or between farm and farmer. "Money makes the mare go," but it is pride of possession, and the natural affection that should exist between man and his faithful servant, that keeps the mare fat and sleek, and enables her to continue going.

To be proprietor of a piece of God's earth large enough to feed and comfort a family, and large enough to afford free air and wholesome exercise to all the living creatures it nourishes, is a thing to be proud of. If it not adorned with natural beauty, adorn it. If the soil is not naturally fertile, generously fertilize it. One of the most lovable women the writer ever knew, wore red hair and four hundred freckles. Culture and conscience had made ornaments of what, in others were blemishes. A farmer who loves his farm home will make it beautiful, though located on a piney woods hillside.

But love of home and farm is not sufficient to make an ideal farmer. He must have enthusiasm. No man ever achieved distinction in any calling without enthusiasm. The farmer who hurries home from the country festival that he may see if his seeds are coming up, to see how much this crop or that one has grown; who loves to exhibit to admiring friends the beauty and graceful movements of his favorite colt; who talks respectfully to and caresses his milch cow; who rises in the morning before the crowing of the cock that he may work upon his plans for improving his estate, may be depended upon to become an ideal farmer. He will find no time to whittle goods boxes, and little for the discussion of current politics with the ward heelers of his market town. His heart is where his treasures are, and his farm and family being his treasures, there his interests centher and thither his tracks tend. His time and talent will be taken up and fully occupied with work and plans for the improvement of his farm and the comfort of himself and family, and domestic animals. Love of home is one of the noblest instinct of humanity. To a right-thinking man, the place where all the fondest emotions of life were exercised, where is children were born, where they prattled and played, where they grew to manhood and womanhood, and where, perhaps, some of them sleep beneath sod, must be a hallowed spot though ever so humble, and if so, the chief effort of his life will be to cherish and benefit and beautify such a home. For this purpose a large bank account is very useful, but by no means essential. Love of home, enthusiasm in his work, and energy of mind and body will ultimately effect their perfect work; and the result will, sooner or later, be an ideal farm and an ideal farmer, not, perhaps, according to the estimate of sordid avarice, but strictly in accordance with the ideal of Texas *Farm and Ranch.*

PEAS AND OATS.

Ed. *Hoard's Dairyman.*—I see inquiries about peas and oats. I raised seven acres in 1898, and will say that I think that there is no hay that

equals it. I sowed one bushel of Canada field peas to the acre on plowed, not fitted ground, then fitted the ground and sowed two bushels of oats. I cut in the milk, and cured in the cock. All the fault I have to find is, that the mice like it as well as cows and horses. It has a large per cent of protein, and I think it is a splendid feed to help make a balanced ration of corn fodder. I live forty miles east of Cleveland, Ohio.

H. J. C.

Iona, O.

AN EVERLASTING FODDER PLANT.

A Mr. M. C. Ginster, of Erdington, Birmingham, England, describes this plant in a recent issue of the Lincoln *Mercury* and speaks of it as furnishing a means to the British farmer for overcoming the agricultural depression which seems to be hovering around him. He points out that after the second year this plant will yield from six to seven tons of hay per acre on poor stony, sandy land. Further on the writer says : "This plant requires no manure, and after the second year, no care ; it is independent of all weather, and when the sun has burnt up everything else it keeps on growing. It yields abundant crops for fifty years, and according to analyst's report, is richer than pure oil cake ; so rich that to one ton of lathyrus hay must be added two of straw chaff. It is suitable for all cattle, notably milking cows. Farmers thus need not buy oil cake and other feeding stuffs, but can save the money formerly expended on them, and by merely using up land totally valueless for any other purpose whatsoever. If their land is swampy the plant known as 'pologonum,' and quite as nutritious as the 'lathyrus,' would be of service." If this plant, which Mr. Ginster calls the "lathyrus," will do onehalf what he claims for it, it is just what the dairyman and cattle feeder of every country requires. If any of our readers know anything about this wonderful plant or have had experience with it we should be glad to hear from them. A plant known as Lathyrus Sylvertris has been grown on the Experimental Farm, Ottawa, for several year in small plots.

To clean a rusty plough or cultivator use sulphuric acid, four ounces to a pint of water, handling the dangerous acid with care. Pour the mixture on the rusty place and when the rust is softened scour it off with sand, dry and coat with grease. A plow treated this way will quickly brighten when used again.

The largest horse in America has been discovered in Illinois. He stands twenty hands high, weighs 2,500 pounds, and has never been either broken or shod. He is nearly a pure blood Clydesdale. Of course he is a freak, and not likely to be worth anything except for exhibition purposes.

A writer in the *Practical Farmer* says : "I have cured my horses of colic several times with common salt. Take a large handful and put it back as far in the mouth as possible. Hold up the head so they cannot spit it out. More salt will not hurt them. They will generally be all right in an hour or two."

Here is a good recipe for curing hog meat so that it can be used in summer as well as winter. The proportions are to 1,000 pounds pork take ten quarts fine salt, three pounds brown sugar, and a little salpetre (dissolved). Mix and rub on the meat as soon as cut up. The meat is laid on a board about ten days, then sewed up in a cloth bagging.

The Flock

PROFIT IN FEEDING LAMBS

To the Editor of Farming :

Replying to your letter in regard to the lambs which I am feeding, I cannot give much information, as the lambs are to be delivered in February and I cannot tell what the results will be. But I fed forty lambs a year ago with a certain amount of success and I will endeavor to give the method, rations, etc., followed then.

About thirty of these lambs were well-bred Cotswolds and ten were Shropshire grades. My experience tells me that the Cotswolds are far ahead for winter feeding. After weaning, the lambs had a small patch of rape. When this was done they were turned on clover till the snow came, when they were taken under shelder and fed lightly for a couple of weeks. On December 8th they were weighed, averaging 105 lbs. each.

The lambs were then fed for eighty-five days on the following: clover hay, 1¼ lbs. per lamb per day or 106 lbs. for the period. This at $5 per ton would be 26½ cents for each lamb; grain, ground, 1½ lbs. per day per lamb or 127½ lbs. for the period, worth at 80 cents per cwt. $1.02. Turnips 10 lbs. per day per lamb or 850 lbs. for period, worth at 6 cents per lb. 85 cents per lamb.

From this I deduce the following:

Cost of feeding one lamb eighty-five days.

106 lbs. of hay at $5 per ton	$ .26½
127½ lbs. of grain at 80 cents per cwt.	1.02
850 lbs. of turnips at 6 cents per bus.	.85
Total cost,	$2.13½

Adding to this the cost of each lamb $2.50, we find the total cost to be $4.63½.

At the end of the fattening period the lambs weighed 134½ each and the price I received was 5 cents per lbs. or $6.72½ each and, therefore, the profit per lamb was $2.09 and on the 40 lambs $83.60. From this the price of pasture for probably two months should be deducted.

I find it profitable to cut the hay. In feeding in racks the lambs pick off the leaves and heads and waste a great deal of the best feed, but when it is cut they eat it up clean.

I find that sheep are the most profitable part of farming, and if in answering your letter I have been of any service to you I shall be very much pleased indeed.

Respectfully yours,

WM. RICHARDSON.

Vandorf, Ont., Dec. 23rd, 1898.

Swine.

BACON PRODUCTION

TO THE EDITOR OF FARMING:

We have read with great interest the articles appearing in *Farming* from time to time on the above subject and among others those from the pen of Wm. Davies, C. C. L. Wilson, F. C. Fearman, and others. M. Davies speads in the Exhibition number of the brutal treatment which the hog is subjected to before reaching the slaughter house. We are sorry to say that we, too, have seen the poor brute lying covered with marks, bruised and bleeding, and must before long if living be a mass of scabs and sores. We do not think this necessary with properly constructed pens and also with proper methods of loading and unloading at the shipping stations. The buyers could tax the marks found on the animal and in this way reduce the the evil very materially. Mr. Fearman's letter gives very positive information as to breed and feed and a great deal of it is valuable, but like the cow with the "mullen," we must reject some of it. His absolute prohibition, "Do *not* feed corn" or "avoid corn" in the light of Professor Day's experiments, does not obtain. It does look unreasonable that sweet, well-matured corn with a mixed ration of mangels or sugar beet, barley or oats, etc. (which by the way I would advise instead of turnips because it is more palatable), could possibly make anything but sweet and nutritious bacon, providing the hogs have been kept in thrifty condition.

No doubt Mr. Fearman when advising out-door exercise for the hog was right when the wheather is not too inclement, as the animal requires it in order that he may develop muscle or flesh instead of fat. It is also beneficial for health, and without health we cannot have growth for thrift. We do not agree with Mr. J. L. Wright when he says, "To allow hogs to range at will would simply spell ruin to farmers foolish enough to be led astray by such talk." We never had hogs do better than when fed in a clover or lucerne pasture and finished there, and we are convinced that Mr. J. L. W. would find his profits much larger if he adopted the more sensible plan of feeding his hogs and finishing them too while ranging in the clover or lying, stretching and growing in the orchard, for at least six months of the year. We have made a practice of penning only when we must. It must be understood that we do not allow the pigs to run everywhere or anywhere, but confine them to their own plots. It is important that further experiments be conducted at the O. A. C. with regard to result of feeding *corn*, as we have found a mixture of corn, shorts, and mangels or sugar beet a profitable ration in so far as growth is concerned.

A. READER.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

Many housekeepers complain, and say : I have been working hard all day, I am so tired, and I seem to have done nothing that calls for any credit !

Yet let these same things which have tired her out be left undone, sad would often be the plight of the house to say nothing of waste and extravagance.

To manage a house with care and economy, the carefully trained eye of the Mistress must ever be on the alert, to set right any little short-comings of servants. For, although these might be even fairly good, strange things often happen, such as packing away dirty vessels and forgetting all about them till wanted ; leaving small quantities of milk in small jugs to sour, and filling the same with fresh, trusting to chance not to be found out, and when detected putting a bold face on the matter but seldom a penitent one.

It is only the real house-wife who can feel a true sympathy with all these little worries, and there are many, where matters are even worse than those I have spoken of such as burnt cakes, which are thrown into the fire, and how many eggs are wasted in poaching I should be afraid to say, but these and unnumerable others make up a total of the responsibilities of housekeeping, so great that a conscientious woman hesitates before taking upon herself the task.

And after a hard day of these trials, which make so little show and must be gone over again on the morrow, is it any wonder that the cry comes from her, how disheartened she is in trying to keep her house in order ? It is only love-service and the desire to have a true home which helps to keep up and save her drooping spirits.

A WARNING ABOUT THE MOTH

Might I give a friendly warning to those people who have valuable furs, and remind them that now is the time to save them, by keeping them in a clean calico bag, tied firmly at the mouth.

Do this and there will be no fear of the little pest laying its eggs in them and thus starting them on the road to their destruction. Delay, and it may be too late.

In March, and April, these little creatures are in full wing, searching out favourite spots and places on which to deposit their eggs, and, when once this is done, camphor and many other remedies are of no use.

I have given the bag question a fair trial.

I annually open a small bag of wool which I put in and tied up 4 years ago, and yesterday I opened it, and found all things just as good as when I put them in. No further proof is necessary, and one can only attribute the anual loss of furs to the carelessness of the owners.

COOKING HINTS.

When thickening is required for sauces, soups or gravy, it should be mixed carefully and smoothly, then added to the liquid which it is intended to thicken. Before adding a thickening, see that the saucepan is drawn back from the fire and has ceased boiling before the thickening is added to it, or it will be lumpy in spite of all the smooth mixing. For thickening soup, work the flour well with a little cold liquid, stock or milk as the case may be, then add very gradually half the stock, then the remaining half all together. For the making of ordinary sauces flour and butter are employed. Melt the butter in a clean saucepan, spinkling in the flour by degrees and stirring till the whole forms a creamy mixture, then add milk or stock according to the sauce needed, add stir continually till the sauce will coat spoon, which is a sign that it is sufficiently cooked. Should the sauce be not wanted at once, set the saucepan in another pan of hot water and let it stand till wanted.

CUSTARD MAKING.

A good custard can be made with one pint of milk, the yolks of three eggs, and twelve lumps of sugar. There are several methods of making cup custard, but I think this is the best one I have tried, and as it differs rather from the usual method of making this sweet, I will give you the method. Take three eggs and break them separately into cups, next beat the yolks well together, add the milk and stir well, then strain a jug adding about twelve lumps of sugar and a flavouring of either almond or vanilla, then place in a saucepan of boiling water and stir till it thickens. If over-cooked the custard will curdle and so be spoilt.

Cycling is excellent for rheumatism, constipation, corpulency, indigestion, and liver complaints. Take regular exercise on your cycle, and see that your diet is light and nutritious.

Oatmeal is invaluable for supplying the teeth with nourishment, so also is brown bread, as it contains, in minute quantities, lime. Brown bread has always been recommended for bone and tooth building, therefore should be given to children in preference to white bread.

DANGERS OF THE MILK JUG.

A great deal of attention is now being paid to the dangers which lurk in uncooked milk. Scientific research has proved beyond doubt that tuberculosis in cows can be conveyed to human beings in the milk. The particular from of this disease which is conveyed in milk is consumption of the bowels, and the chief sufferers are little children, whose chief food consists of milk diet. A Royal Commission has been held to report on the health of cows kept in cow-houses, and the result is very startling. However much care is bestowed on cows kept in confinement, it is certain that such conditions of life simply invite tuberculosis, and it has been calculated that at least half a million of those cows whose milk is daily sold, suffer from the disease. It is a curious fact that England is almost the only civilised country which consumes such large quantities of uncooked milk. In many foreign cities milk is supplied in sealed glass bottles, and the milk in these bottles, before it reaches the retail dealer, has been raised to such a degree of heat as to destroy all germs. Comparatively few mothers are alive to the necessity of cooking milk before using it as children's food, and those who do realise the danger, complain that they cannot depend upon their servants to do it regularly. Surely such a duty is one that should be undertaken by the mother herself when the health and welfare of her offspring depend upon its due observance. When the milk first comes into the house it should be immediately put into an enamelled saucepan, kept entirely for this one purpose, and brought up to the boil. One moe ment at boiling point and all danger of tuberculosis vanishes, and not only the germ of this fatal disease, but those of scarlet and enteric fevers likewise, for uncooked milk it is well known. is a most active disseminator of these two great scourges to infant life.

A NOVEL IDEA FOR THE NURSERY.

A nursery floor should always be bare at the sides, but covered in the centre with a good thick rug. Is it often urged that bare floors are not good when there is a baby who spends most of its time creeping about or playing on the floor. If a baby is learning to creep in cold wheather I do not think it at all desirable that it should creep upon the poor at all. Creeping is the exercise by which a child strengthens its limbs for the first effort to walk, and it gets just as much valuable exercise by crawlings back and forth over a small protected surface, say from three to five feet wide, as it does crawling over the cold nursery floor; were it is constantly catching cold and running the risk of being hurt by its older brothers and sisters in their rough play. A clever lady writting on this subject says: It saves infinite trouble with a creeping child if it is confined in a pen placed in one corner of the room, or better still, the child may be raised from the flour by placing him on some low couch surrounded by a railing. Such a pan may be easily contrived without much expense. In this enclosure a baby may be placed from the period when he begins to creep until such time as he has learned to walk with certainty and vigour. By means of the side of the pen he is soon able to raise himself to his feet, and by clutching the firm rail he easily learns to walk round its circumference, which to him seems endless. With a few simple playthings for company inside the rail, and with a friendly face and voice outside, but within sight and hearing, the child during this usually most troublesome period of its life becomes simply no trouble at all, but grows and thrives and shows that it is absolutely unnecessary for a creeping baby to undertake the dangerous navigation of the nursery floor.

TURPENTINE.

Manifold are the uses of turpentine. Turpentine is an article that should always be kept in the house. It can be use in many ways, and take the place of more costly remedies for many things. It has a disagreeable odour, but its numerous virtues should always recommend it. For a severe cold in the chest and throat, turpentine mixed with a little healed sweet oil, or goose oil, or melted lard,

and rubbed on the chest, then covered with a warm flannel, will prove very effective. Any of the creeping, crawling things may be driven away from the house by pouring turpentine on shelves or in the crevices that they inhabit. For aching joints and muscles a little diluted turpentine rubbed in thoroughly is a recommended remedy. If you wish to break a glass bottle or jar evenly about the neck, the easiest way is to soak a piece of string in turpentine, and tie it around the neck or wherever it is to be broken, and then set fire to the string. The glass will snap off along the heated line. In laundry work a few drops of turpentine added to the cold water starch will prevent your iron sticking and make ironing a pleasure. Also, nothing makes a better polish for steel than powdered bathbrick mixed with turpentine.

To prevent fly specks, boil three or four onions in a pint of water, and with a brush go over the picture frames. Flies will not light on articles washed in this solution.

RULES OF HEALTH.

Those who wish to retain good health should follow these rules, according to the Medical News: "Eat fruit for breakfast and luncheon. Avoid pastry. Shun muffins and crumpets and buttered toast. Eat wholemeal bread. Decline potatoes if they are served more than once a day. Do not drink tea or coffee. Walk four miles every day. Take a bath every day. Wash the face every night in warm water, and sleep eight hours.

The Garden and Orchard.

(Conducted by Mr. Geo. Moore).

SPRING.

Once more in the order of Nature Spring is approaching; it has always been looked upon as a season of joy, and its advent made the theme of many a poetic lay.

In all temperate latitudes Spring is hailed with delight, but how much more grateful is its coming in those where, for more than half the year, the earth and the waters are held in winter's icy grasp.

The very word, "Spring," seems to imply a departure from inertness to activity, from rest to labour, from death to life.

To the farmer and gardener it is a season of heavy responsibility because the work which it brings must be done promptly and expeditiously, and upon its performance in due time and manner depends, as far as human skill is concerned, the success or failure of the whole years operations.

If the long season of rest from actual manual labor has been spent, as it should have been, in laying out plans for the busy spring-time, and the cultivator, like a good general, before commencing a campaign has well studied all the contingencies and difficulties which he may have to encounter and the best means of overcoming them; has got all his arms in good order, his amunition ready, his commissariat well supplied, and his men well drilled, he will be ready to march at the call of the first harbinger of Spring, and will gain the victory over many an evil which would destroy the work, and ruin the hope of the careless and indifferent.

There is an old saying: That a Spring neglected is a harvest wasted. It is an easy matter to neglect an opportunity, and with disastrous results; if we put off the sowing, when the land is ready, for a single day, we do not know how much longer we may be delayed by an adverse change in the weather, which would render the land in an unsuitable condition, and if we sow too late we may say that the spring is neglected and the crop injured if not lost. We therefore should have made up our minds long beforehand what seeds we propose to sow and have them ready. When shall we learn that promptness in action in such a climate as ours is especially important, or that Nature here is prompt and quick in her growths and to keep pace with her we must be as prompt and active?

There are certain other matters beside cropping the land which will claim our earnest and prompt attention in the spring, namely the care of the orchard as regards the prevention of the destruction wrought by insects and fungous growths. We do not want to wait until the mischief is begun to use preventive means, but examine the trees carefully to see if there are any signs of a lodgement of spores or larvæ in any of the cracks in the bark or fork where the branches join the parent stem, and scrape them well, saturating them with Bordeaux mixture and Paris green or

giving the trunks a thin coating of lime wash in which a little sulphur should be mixed. If this were done thoroughly, early in the spring, before the trees have leafed out, there would not be the necessity to spray before the blossoms have fallen to prevent the apple scab, but it could be done effectually after the fruit had begun to swell and thus the damage could be prevented, and the bee keeper would not suffer.

And as soon as growth commences, as of old, the tares will come up with the wheat or in other words, weeds will come up with the crop, and then the need of promptness will be apparent. I remember a half acre of carrots being neglected *one day* when they where fit to hoe and thin; the next day a showery time set in and that patch of carrots was a nuisance and an expense and never made a good crop after all.

As we have said, spring time is, in Nature, a season of activity and life; the cultivators privilege is to aid in the developement of life and bring it to full and profitable maturity. The only thing he is justified in killing are weeds and insects; certainly not time, for, as it has been well said:

> Kill time to-day and to your sorrow,
> He'll stare you in the face to-morrow.
> Kill him again, and 'tis most true,
> You may kill time, till time kills you.

Judgement to plan, promptness to execute, perseverance in the face of difficulties, determination to use every effort to succeed, with a firm reliance upon that Providence which has promised that seed-time and harvest shall not fail, are the qualities *we must cultivate to achieve success.*

GEO. MOORE.

QUEBEC POULTRY SHOW.

March 1, 2, 3, 1899.

Too much praise cannot be given to the enterprise and indefatigable exertions which the managers of the Quebec Pet and Poultry Association have devoted to the good cause of encouraging the raising of superior poultry, and when we look back upon the days when our farm yards were over run by a race of draggle-tailed, miserable mongrels to which no attention was paid, and contrast them with the marvellous specimens of the pure breeds, or well assorted crosses of the present day which were exhibited on this occasion, we must acknowledge, that poultry has kept pace with the improved methods of farming. The importance of the industry, from an economical point of view, is, or has not been, appreciated as it should be, but it is hoped that it is coming more to the front, and that our farmers will see that a homestead is not well equiped without its well ordered and carefully tended poultry yard.

With the present facilities of shipping, and the markets which the supply will create, now we can fill them with well fed birds in good condition; and with eggs of undisputed freshness, there need be no fear, for a long time to come, at least, but that poultry keeping, if intelligently and systematically managed, will be amply remunerative.

It will therefore be evident that gentlemen who devote their time and talents to the development of this industry are public benefactors and deserve credit as such; only those who have attempted to take a leading part in getting up such exhibitions can imagine the thousand minor details that must be attended to, to insure success, and how these usually devolve upon a few of the most active of the committee. In this case, every member seemed to do what was required of him, and, headed by their most active and untiring President Mr. Wm. Lee, succeeded in bringing together over 600 pens of the choicest fowls, and a host of visitors to admire them and learn some useful lessons from the sight.

The judging was done by an expert, Mr. Ulley of Montreal, and gave full satisfaction. This method of judging at all exhibitions is far better than the old one of employing several judges. There certainly is an old saying that: "In the multitude of councillors there is safety," but the maxim does not apply in all cases, and one good conscientious censor is much more likely to arrive at a correct conclusion quickly than when two or three have to express an opinion which is not always unanimous, and the best judge is puzzled rather than assisted by his coadjutors.

A number of valuable trophies were presented by the public spirited merchants and others of Quebec, and the governement subsidy of $200 was, in this instance, money well invested. Eclat was given to the Exhibition by its being opened by the Lieutenant Governor, attended by the Mayor of Quebec, the Minister of Agriculture, and several members of the Legislature.

The prize list is too extensive to give in detail, but it is gratifying to remark that Quebec held its

own nobly against some of the most noted poultry men. The importance of poultry is well emphasized by recent statistics, which show that our exportations of poultry produce exceeded *nine millions of dollars* last year and are continually on the increase.

It is a well established fact that a farmer can make more profit in proportion to the outlay out of poultry, intelligently managed, than out of any stock he can handle.

ORCHARDS.

EFFECT ON YOUNG APPLE TREES OF KEEPING AN ORCHARD IN GRASS DURING A DRY SEASON. The first Report of the Woburn Experimental Fruit-Farm, England, contains some striking results of the very common practice in that country of keeping orchards in grass for long periods.

The reduction in the size of leaves of young apple trees thus grown was 35 per cent. for dwarf-trees, and 41 per cent. for standards as compared with trees in cultivated ground, the loss of wood growth being 87 per cent. for dwarfs and 74 per cent. for standards; in the case of the dwarf trees, too, there was a reduction of 71 per cent. in the weight of the fruit crop. The ill effect of grass round the trees was much greater than that of weeds. The report states, however, that in a year of greater rain fall the ill effects of both grass and weeds would probably, be considerably less than in the dry seasons in which these investigations were held.

CEMENT FOR REPAIRING CHINA.

An excellent cement for mending China articles when broken can be made by mixing flour with the white of an egg to the consistency of a paste. Hot water does not injure (as a matter of fact, it rather hardens) this simple cement.

(*The Farmers' Gazette*).

The Poultry-Yard.

A. R. JENNER FUST, ESQ., *Editor of the Provincial Journal of Agriculture, Montreal.*

DEAR SIR,

I give beneath the weight of eight cockerels: Barred rocks, five months old, dressed and ready for table use. The total weight was 65 lbs. without any special fattening, they were culled for the owner's use, as he does not believe in keeping unproductive stock; they were taken from a large flock of some forty young birds hatched in July and August 1898. The pullets, beautifully marked, are now laying and have been since December last: a pretty good record for weight. I saw the carcases as they were being dressed; the flesh was a beautiful golden color. Just the thing to suit our American neighbors.

Now for the egg record of four hens of the same breed which were not quite out of their moult; they began to lay December 1st, and laid in December 94 eggs, and laid in January, 115 eggs, pretty good for four hens.

These hens are owned by Mr. Wm. Lee, Mayor of the parish of Notre Dame de Quebec.

S. J. ANDRES.

QUALITY.

Low prices are more the result of lack of quality than anything else and as long as the farmers pay no attention to breeds and refuse to give attention to the quality of their stock, just so long will they fail to realize good prices for that which they send to market. There is no one "price" for any in market, but there are "prices," the difference being so great as to render it impossible to fix upon any sum as the average. A choice extra fowl may sell as high as fifteen cents a pound, while an inferior fowl may not sell for five cents a pound.

There is not a large sum as difference—ten cents—but it is large comparatively, and allows of a greater return from a superior fowl than is obtained from three inferior ones. It is the earning point of profit and loss, as the way to secure large profits is to sell only stock of the best quality, and to secure large profits and to secure choice stock, you must both *breed* for it and *feed* for it.

FARMERS SHOULD IMPROVE THEIR FLOCKS.

How many farmers fully understand the proper way of keeping poultry?

Very few compared with their number and it may be said that it is not every farmer who even knows the different breeds. This is a condition of things which does not apply to any other class.

The carpenter who does not know the different kinds of wood he uses, or the machinist who cannot distinguished iron from steel, would be regarded as lacking in the knowledge of his trade and of the essentials to his success. The first essential to success is for one to understand the materials he is working with. If his foundation is not secure it will be but a question of time when his structure will go to pieces. Many people try the poultry business as a resort from something else, and estimate that certain profits can be made if care and proper attention are given. They are in earnest, and really mean to use every effort to succeed. But they find that the most difficult part of the undertaking is a lack of the knowledge of the proper attention to be given. No one can make any large sums as profit without capital. It is not that success is impossible, but that those who enter the business are not satisfied with small beginnings, or ordinary profits. It gives a fair profit from the investment, but those who wish to make 50 or 100 per cent profit will find that it cannot be done; yet many attempt it with from $500 to $1,000 and expect to make the entire living of their families. Be satisfied with ordinary profits, make the business grow, and increase and success will be more sure.

S. J. ANDRES.

THOROUGHBREDS FOR EGGS.

A writer in the *Country Gentleman* speaks of thoroughbreds as egg producers. He says: It is generally admitted that thoroughbreds are better egg producers than common stock. With this I must heartily agree; yet I dare say that nine-tenths of all the eggs raised in this country are from crosses or mongrels. This does not change the fact, however, that thoughbred fowls are better layers. The average farmer has but a vague idea of what a thoroughbred is: he calls any hen having similar markings to that popular breed the Plymouth Rocks, or any large light colored female resembling a Brahma, by that name. If he understood the meaning of the word he would know that "bred from the best blood" is thoroughbred; there is no other kind. Crosses resembling the different breeds from which they come, lead to those mistakes and after crosses have been crossed and recrossed we have the common barnyard mongrels. The beautiful, therefore, gives us the best blood which we endeavor to develop into the best egg producer. Thoroughbreds are the best egg producers and to improve our flock new blood must be obtained. Therefore we go to the fancier for it as he alone can guarantee it. If we are fortunate enough to obtain a strong and healthy specimen, it remains with you whether with proper care and food we can make him into a utility breeder. The improvement of a utility flock is due entirely to the introduction of new and fresh blood: thus can be obtained the vigor and strength to create egg producers. S. J. ANDRES.

IN-BREEDING OF FARM POULTRY.

It is conceded now by all thinking men that however beneficial in-breeding may have been in the formation of breeds, the continual practice of it leads to diminution of size, decrease of vigor, and greater tendency to disease. Hence, it is now being avoided by intelligent farmers among their cattle, dogs, sheep, or horses. In the poultry yard, however, in-breeding is the rule instead of the exception. It may be avoided only by the ruthless slaughter of all the males over a year old, and the purchase of fowls not related to the flock on hand. The easiest way for the farmer to avoid in-breeding is to purchase every year one setting or two of eggs from some reliable breeder of the same breed but not akin. This is what may be called line-breeding and is the safest in all kind of stock. We do not advice cross breeding in fowls or in anything else unless the progency is intended for meat production at the earliest practical period. We therefore advice all farmers to avoid crossing breeds. Let them select whatever breed they think will suit them best. If they make a specialty of egg production, select a laying breed. If their object is meat production, select the large breeds. If they wish to combine both let them take the medium breeds of Plymouth Rock type, or Wyandottes. White I prefer, because they make the best looking carcass when dressed and have no pin feathers to show dark in color. Having once selected the breed and only one breed stick to it, until there is some good reason for making a change, and then, instead of grading back, buy a few settings of eggs and clean out everything else. A little attention to this will render poultry much more profitable than it usually is on the farm. We do not ask

the man of the house to read this ; he is not very likely to pay much attention to it. The most we can hope from him is that he will mark this article and ask his wife to read it and we believe that she will give it the attention we hope for, and give no peace until he procures a setting of eggs of her favorite variety from which to grow the cockerels for next year's use.

S. J. ANDRES.

The Grazier and Breeder.

RAISING THE DAIRY CALF.

Given, a cow of pronounced dairy type and ancestry, her calf which would naturally be expected to take after her, can yet be spoiled in raising it. Great intelligence, indeed, is required to raise a calf, so that it shall eventually develope into a good dairy cow. Simple as are the principles involved, they are not easy of successful application.

As far as it is possible, the cows in a herd should be so timed as to come in, one or two during each month of the year, but with the large majority dropping their calves about the last week in October. Directly these fall calvers come in, they should be stabled, and only allowed out again on exceptionally fine days. The calf, on being dropped, is best taken away from its mother immediately, (Good. ED.) not being allowed to suck her at all. After a good rubbing over (1) with dry straw (in a box which should be reserved for the purpose, away from and out of earshot of the mother, so that the pitiful bleatings of the young calf shall not disturb and excite its mother), it is well to leave the calf for about six hours to get up an appetite, as it will always be found easier to teach a calf, when thoroughly hungry, to drink out of a pail, than when only indifferent to a feed.

I shou'd advise that the calf be allowed its mother's milk for fourteen days after birth, as I am sure a great many of those watery eyed, dry haired, ill conditioned calves of a month or so old, can be accounted for by their being put on to the skim-milk ration before their bony structure and general system is able to stand the change. (Very sound. ED.) About the fifteenth day after birth, some sweet sterilized skim-milk may be warmed up and fed with as much of the new milk mixed together, at the usual hour. Then, feed this mixture (always at 90°) of skim-milk and new milk half-and-half for one week, and then make the ration about as nutritious as the new milk by adding to it flaxseed gruel, made by boiling a pint of crushed flaxseed and a pint of oil-meal in ten to twelve quarts of water, or flaxseed alone in six times its bulk of water. Mix this one to three parts with skim-milk and feed blood-warm (98° F.) For the first month, a calf needs feeding four times a day, but, after that, for another month but three times, when the calf after this may be fed her milk-gruel twice a day, but always at regular times, which is an important point. It is an infallible sign whether a calf is thriving or not, to note her coat ; if her coat is sleek and oily-looking on the hairs, she is doing well, but if on the contrary her hair is dry and staring, look to your calf, for she's ailing.

Immediately she is two month's old, not before, some tempting spears of early cut hay should be introduced into her loose box, and increased in quantity as she relishes it more and more, and at the same time beginning most cautiously to shorten her milk ration. Also, about this time, I should teach her to eat a few whole oats, and leave a handful each night in her manger.

In case of a tendency to scour, give for one or two meals, a quart of coarse wheat flour in her milk.

From this time until the spring, feed her the milk gruel regularly, but gradually decreasing in quantity, and let her have all the good hay, oat-straw and whole oats she will eat to advantage.

The object now is to build up a frame, strong enough to carry comfortably all the fully developed organs which, as a cow, she will depend on to sustain her. But besides this, the organs themselves must not be lost sight of.

Feed so as to make her have a large round belly, so that when a cow, she may have ample room for lots of nutritious bulky feed, turn her out for a run in the fresh air every fine day, to strengthen her lungs, and keep her feet, legs, and back supple and in good condition, and always bed her well, so as to keep her scrupulously clean.

In the spring turn all the fall calves out into a pasture near the house, so that they may get accustomed to the sight of both man and beast, and so that they can be looked after, for they

(1) We prefer covering the calf up with plenty of straw, as the rubbing agglutinates the hair. ED.

must not for any reason be lost sight of now. Here, daily, feed them night and morning from 1½ to 2 lbs. of crushed oats each, and salt them once a week, or, better still, keep rock-salt where they have access to it whenever they wish.

When the cold weather comes on, in the fall, they should be taken in at five o'clock every night and fed their oats and as much hay as they will eat, and the same next morning, when at six o'clock turn them out again. This treatment may be continued until the weather becomes too changeable and disagreeable, when they should be brought in with the rest of the herd, and tied up in stalls just the same as the other cows.

Now feed them as much bulky food as they can eat, for you want to see big bellies on them; plenty of whole oats for bone; and ensilage, mangels and oat straw to fill up on; if any go to beef, let them go, they will fetch fair value from the butcher the next fall. (1)

All through this winter give them some daily exercise in fine weather, and allow your little boy to occasionally go round and sitting down on a stool as if to milk them, handle their teats, not merely tickling them, but pulling them quite hard, and by this means there should never be any short teats.

During the next summer, the heifers should occupy the same pasture near the house, being constantly watched for signs of bulling, so that those which have not been already served, may be put to the bull, so as to even up the new milch-cows throughout the year. It is best to commence using the bull on these heifers, the January after they are a year old, so that the majority of them come in in the fall, at two years old, thus establishing the milking habit early.

Before a heifer calves for the first time, she needs good care, more so than subsequently, if it be possible. Give her plenty of exercise, and limit her diet for three weeks before calving. When she calves, never let her see her calf when possible; she never should suckle it, and then will never expect to do so.

Give the heifer a "yellow-drench" an hour after the calf is born, and a daily bran-mash for a week after calving. For a fortnight, or so, rather under-feed her than otherwise, but in other respects treat her as the rest of the cows. At the end of two weeks give her more food, increasing gradually until she fails to respond in milk. Her difference from the rest of the cows ends here and she may be ranked in the dairy, and a record of all she consumes and all she produces carefully kept. Remember 'Tis the calf makes the cow, 'tis the cow (*food?*) makes the calf.

H. WESTON PARRY.

March 2nd, 1899.

(1) Good. Heifer-beef, that is, a maiden heifer's beef, is considered, in England, to be the best of all beef. ED.

Obs.—An excellent essay; indeed one of the best and most accurately correct descriptions we have seen for many a long day. ED.

JERSEY-CANADIANS.

SIR,

Allow me to convey to you my ideas on the subject of Jersey-Canadian cattle. In the No. for October 22nd of the JOURNAL, Mr. J. C. Chapais, in his remarks on this subject, blames any one who keeps on his farm Jersey-Canadians and pure-bred Canadians at the same time. And he is perfectly right in his views, since it is very difficult to keep them together without their interbreeding, and when a cross does take place, the progeny is too often sold as pure-bred Canadian.

In the No. for November 22nd, Mr. Chapais again speaks of the Jersey-Canadians, and concludes by almost going so far as to say that such animals ought not to have prizes offered for them at the exhibitions; wherein he again is perfectly right in my opinion, since a Jersey-Canadian is nothing more nor less than mongrel, or *grade* if you like that term better. I have always been surprised at a herd-book having been opened for these animals, as I think it would have been just as absurd as opening one for Ayrshire-Shorthorns. In my opinion, the Agricultural Societies ought never to have offered prizes for these mongrels; their place at exhibitions is sufficiently well designated among the grades, and they ought never to have been allowed to enter in any other class.

When Dr. Couture wrote to me on this subject in these words: "This *race* must disappear sooner or later, rather sooner than later," I think he was quite right.

(In England, we should qualify the Jerseys as a *race*, the Jersey-Canadians as a *breed*. For example: the Shorthorns are a breed, the Devons a race). ED.

Jersey-Canadian bulls are seldom sought for by Clubs or Societies: they always want Ayrshires or Canadians.

At Berthier, interested parties, by underhanded means, succeeded after many attempts, in getting a class opened for these cattle. When there are none such, Canadians are entered as Jersey-Canadians, and the "dodge" is allowed!

In speaking as I have of these cattle it must not be supposed that I am speaking in my own interest, as I have several head entered in the herd-book. As our Agricultural society is in debt to the amount of about $1,000, I hope this class will be omitted in next year's programme.

(*Signed*) A. MOUSSEAU.

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

The Dairy.

THE ADVANTAGES OF CREAMERY BUTTER.

The first important fact we have to meet is that creamery butter has established a reputation for uniformity in quality. Here is a double merit—a good reputation for uniform good quality, which, once established, makes a good market for almost anything, and uniformity in the product, an evenness of quality in large quantities from the same source, made at the same or different times. This uniformity is a great point, attractive alike to the merchant and to the consumer. For example; take a carload of farmers' butter arriving in the market, say a thousand packages, every one of these has to be examined, tested, to determine its grade. Very few makers of small quantities have such a reputation for a uniform article as to have it accepted week after week, and priced after examination. But it is a very common thing for a carload of creamery butter to be unloaded and placed in store without opening more than half a dozen tubs in the lot. You can readily see what a great advantage this is to the receiver and to all merchants who handle it. No such transaction could be possible in dairy butter. It would be difficult to find so large a quantity without there being half a dozen different grades, and the buyer would certainly not feel safe until every parcel in the whole lot had been sampled, no matter whence it came. Every butter-maker knows what a difference there is in the home product, at different times. Sometimes the best butter cow is dry, sometimes at her best; now, the feed is first rate, and, again, it is poor; sometimes butter won't come, and when it does, it is soft. Is it any wonder that the butter from the same dairy differ, in its appearance, its consistency and its whole quality, week after week? With such varying circumstances upon a single farm, with eight or ten cows, just think of the variations upon a hundred separate farms. How is it possible, when such a difference exists in the stock and the owners of it, in the pastures and the water, the management and the making, for the butter from the hundred farms to have any uniformity? It is not possible, and that is just what is the matter. But now let all the milk, or all the cream, from the thousand or more cows on the separate farms be brought daily, or twice a day, to one place and thoroughly mixed. You see at once how the "law of averages" will give you a remarkable uniformity day after day, and month after month. In so large a number, there will be so many cows of one kind in milk, and just so many of another, just so many fresh, and so many giving rich strippings only. But, add to this uniform, methodical treatment of the milk, or cream, and the butter made always exactly in the same way and by the best butter-maker that can be found on all those hundred farms, and whose whole time is devoted to the work, and it becomes clearer and clearer why the butter so made is uniform in quality and of a high grade. Moreover, let the many different owners of these cows, men who have an equal interest in the result, consent to be governed by rigid rules wisely framed, to guard against those mistakes in feeding and management of cows which so often injuriously affect the butter, and the reason for of a uniform product becomes clearer still. This is the creamery system. The advantages of this system are very great. The expense of manufacturing, including the maintenance of apparatus, etc., as well as labour, is so much less in proportion, when well conducted at one place, and for large quantities, than for small lots of a hundred different places. The advantages in disposing of the product in large quantities and by an expert agent, whose special duty is to watch the markets, are as great as in the manufacture. Last, but not least, is the great relief of having the milk or cream taken off the farm, saving all other labour and care. And this relief comes, as a rule, to that part of the working force of the farm which needs it most: the farmer's wife and daughters. Often this dairy duty is just

so much addition to the ordinary cares, which are of themselves as great a burden as should be borne. Not only relieve the hands of the butter making task, but take it by this change entirely off the mind, and a wonderful improvement takes place in the whole household-atmosphere.

AYLMER.

THE DUAL-PURPOSE COW.

ED. *Hoard's Dairyman*:—In passing, I must say that I do not agree with all dairymen as to the ideal type of the dairy cow. I believe that many of them are carrying the idea of both narrowness and leanness to an extreme, and that some day, not far off, a heavy penalty will be enacted because of the extreme to which both ideas have been carried. But this point is not relevant to the subject that is being discussed.

The extremest type of beef cow is not usually a good breeder, nor is she a good nurse. Those then who breed this cow should, it seems to me, be content with high attainment in beef production, and therefore should not push the extreme beef form to the extent of injuring the powers of reproduction. Now, this cow must practically produce all the beef that is wanted to feed the millions of the Nation, on the assumption that there is no place for the dual-purpose cow. This she cannot do unless she is kept and numerously kept, on arable farms. The best authorities are agreed that the palmiest days of open ranging are a thing of the past. They believe that cattle production is decreasing on the range, and that it will still further decrease, because of the encroachments of the sheep industry. While the view thus expressed is doubtless correct, I do not expect to see cattle production decrease to any great extent in the range country, since the mountain valleys are being made to produce much food for live stock through the aid of irrigation. But is is pretty certain that cattle production cannot be greatly increased on the ranges, because of the influence of rapidly increasing bands of sheep upon the pastures. And it is equally certain that our population is increasing very rapidly. Whence then is the additional beef to come from that is wanted to feed those coming millions? The second source of beef supply is the pastoral farm. But it is fair to infer that pastoral farms, like the ranges, are stocked to their full capacity. The only place, therefore, from which these supplies can come is the arable farm.

This brings up the question: How shall beef be grown on the arable farm? All will concede that it can come from two sources, that is to say, from the beef cow or the dual-purpose cow. Now to the writer it is evident that it cannot come from the straight beef cow without much relative loss to the farmer. In other words, beef cannot be grown on the arable farm from the straight beef cow that will bring the farmer as high a return as he will get from his dual-purpose cow in meat and milk. The return will not be nearly as much from the straight beef cow as from the dual-purpose cow. The former will, of course, produce but one calf per year.

Now suppose that the calf weighs 750 pounds at the age of one year, which is a good average weight, and that it sells for $4.75 per hundred in the market, which is probably a fair average price for such meat. The entire return from the cow during the year will be $35.63. That is all that the owner gets from feeding that cow and calf for one year. It is clear, therefore, that he makes but little profit. The dual-purpose cow will produce a calf that will weigh, at least, 700 pounds at one year, and that will sell for $4.50 per hundred. The calf then is worth $31.50 in the market. But the cream from the cow will bring in a return of $30 additional. The return for the season, therefore, from the dual-purpose cow is $61.50, as against $35.63 from the straight beef cow. The comparison is, I think, a fair one. Of course, the extra labor is not to be lost sight of.

Now remember, please, that I have been speaking only of good averages. Let no man seize upon those figures as representing my views of the highest possible production from the dual-purpose cow. Are we not therefore shut up to the conclusion, first, that the additional beef wanted to feed the increased millions of the nation must come chiefly from the arable farm; and second, that it must come chiefly from the dual-purpose cow on the arable farm? Why then should I be held up to ridicule for advocating the cause of the dual-purpose oow?

Wherein I ask will such advocacy injure dairymen? Push the idea that there is no dual-purpose cow to its utmost limitations. Grant for the time being that every farmer accepted that view, what, in time, would it mean to the dairy interests? It would mean that only straight dairy cattle or

straight beef cattle would be reared on the arable farm. Now, the beef grower with his sole return of $35.63 for his cow during the year and the food fed to the calf would be no match for the intelligent dairyman. Dairymen would ultimately possess the arable farms of this country. Could a worse calamity come upon the dairy interest? What would they do with their products? In the sight of reason and self interest, from the standpoint of prudence, and in the face of unanswered, and I think unanswerable demonstration, would it not be better for the dairyman manfully to concede that there is a place for the dual-purpose cow upon our farms? And then would it not be wise for them to adopt the motto as they meet the owners of those cattle, "Let there be no strife between thee and me and between my herdmen and thy herdmen, for we are brethren."

THOMAS SHAW.

University of Minnesota.

HOW FOOD ADULTERATORS ARE TO BE TREATED IN FRANCE.

A measure which has been passed by the French Senate, and will probably be agreed to by the Chamber, proposed to inflict a heavy fine or imprisonment upon persons found guilty of the less heinous forms of fraud or alduration in relation to agricultural products and other merchandise, and both penalties upon the more serious offenders, including persons who use any adulterant injurious to health. All repetitions of an offence, too, are to be punished by both fine and impisonment. The fines extend up to a maximum of 10,000 francs, and the terms of imprisonment up to two years for the worst offenders.

INEFFECTUAL PASTEURISATION OF MILK.

A bulletin from the Wisconsin Agricultural Experment Station describing trials in the pasteurisation of milk for butter-making, states that an examination of thirteen samples of raw milk showed an average of 32,000,000 bacteria in one cubic centimetre (about one-thousand of a quart) while the testing of sixteen samples of pasteurised milk showed an average of 1,800,000 bacteria in the same volume of milk. As this reduction is one of 94 per cent, the result is regarded as satisfactory. For the mere keeping of milk, it may be; and it is stated that the pasteurised skim milk kept twelve to twenty-four hours longer than that which was not treated. But as a security against disease germs, it is hardly worth while to carry out a process which leaves 1,8000,000 living germs in one thousandth part of a quart, or 900,000,000 in a pint.

MILK FEVER TREATMENT.

After withdrawing all the milk, the udder is washed with a desinfectant, and then 4 drachmes of iodide of potassium dissolved in a pint of water are injected into the udder, about a fourth part into each test. This process is repeated in twelve hours (if necessary) using only half the quantity (2 drachms) of iodide of potassium. The appatus required is a syringue having a small tube attached that will readily pass up the teat.

"Not more than a hundred and forty years ago, the roads of England were pronounced to be the worst in Europe."

"By more active canvassing for orders by studying the requirement of costumers, the foreigner, we find, is competing with us on more than favourable conditions."

FOOD SUPPLY IN TIME OF WAR.

The adjourned debate on the Address was resumed in the House of Commons on Thursday by Mr. Seton-Karr, who moved an amendment advocating an inquiry into the question of the large and increasing dependence of the kingdom on foreign imports for the necessaries of life and the danger that might arise in consequence in the event of war. He suggested as measures of precaution that some preferential favour should be shown to colonial produce, that steps should be taken to increase our production of wheat at home, and that the establishment of national granaries should be tried tentatively. Mr. Ritchie, who resisted the amendment, did not believe that there would be any starvation in this country in the event of war as long as the Navy was strong enough to protect our trade route and to prevent

a blockade. The official inquiries that had been made did not justify the gloomy views of hon. members. While he admitted that the price of corn would rise in time of war, he did not believe that there would be any serious scarcity, unless, indeed, that commodity should be declared contraband of war. But an enemy would be unlikely to make that declaration for fear of incurring the hostility of the United States and possibly that of other countries. Turning to the consideration of the expedients which had been proposed, the right hon. gentleman dismissed protection as not being within the range of practical politics, and declared that the adoption of a policy of national marine insurance would impose so gigantic a burden upon the Government that no Ministers in their senses would ever undertake it. The policy of establishing public granaries he showed was open to the same objection. The amendment was negatived without a division.

AGRICULTURAL NEWS AND COMMENTS.

New York States farmers received last year $5 per town for sugar beets supplied the factory at Binghamton, N. Y. The average yield for 1898 was about 20 tons per acre, while the percentage of sugar varies from 15 to 13.

To have fowls with lots of stamina avoid continuous in-breeding; use only mature stock for breeding; hatch chickens under the best of conditions; give them plenty of fresh air; provide for abundant exercise; feed sensibly sound healthful food stuffs, and nature will do the rest.

Farmers in many localities in the United States are anxious to begin breeding horses again, but there are no suitable stallions available. It is estimated that there is not more than one pure bred draft or coach stallion to a county to be bought. Importation has begun, but breeders will have to give up the old cheap service and insurance and adopt business principles.

The native sheep of South Africa have tails weighing as much as 20 lbs., and some with tails weighing as much as 30 lbs. have been recorded. The usual weight varies from 6 to 15 lbs. This curious appendage, which is broad and fat, consists chiefly of fat, which is sometimes used as a substitute for butter. They are a hardy breed of sheep and easy to please in the matter of grazing.

Chapped teats in cows are caused more by wet milking than anything else. The wetting and subsequent drying causes cracks in the skin, and once these harden it is difficult to heal the wounds while the cows are milking. The best remedy is to apply pure vaseline to the teats and soften the skin and the wounds, and milk with great care. After milking the vaseline should be again applied.

It is now clear that the total shipments of apples from America this year will not fall very far short of last year. Up to and including the week ending Dec. 3rd, the shipments from the ports of New York, Portland, Boston, Halifax and St. John, N. B., were 837,620 barrels, as against 571,307 up to the same date last year. The demand for good apples in England is active, and there is no trouble in disposing of large quantities of the right sort.

The cost of producing a pound of butter will depend on the value of the land on which the cows are kept; the value of the cows; the value of the calf; the value of the feed consumed; the cost of labor and the value of manure. Where so many factors have to be considered it is impossible to give a cost that will cover all cases, so much will depend upon the dairyman himself, who has it in his power to lower or increase the power almost at will.

A high autority advances the theory that meat-eaters are less subject to tuberlucosis than vegetarians and reasons, thus: Carnivorous animals are, as a rule, immune to tuberculosis, while, with perhaps, the exception of the horses, sheep, and goat, gramnivorous and fungivorous animals are highly susceptible. Arguing from this, it is believed that more deaths from consumption in the human family occur among people whose diet consists of vegetables than among habitual meat-eaters.—*Farming.*