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THE ILLUSTRATED
Journal of Agriculture

Montreal, May 1, 1895.

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The Journal.

To the Secretaries of the Farmer's Clubs and Agricultural Societies.

These officers are requested to send to the Department of Agriculture, at Quebec, during May, a complete list of the members of their associations who have paid their subscriptions for the current year, in order that the *Journal* may be sent to them during the year beginning July 1st. The lists should be very carefully prepared.

There are now nearly 40,000 subscribers to the French edition and about 10,000 to the English edition of the *Journal*; so, the preparation of these lists is no trifle.

The Secretaries will receive the list of the present subscribers, in which they will be good enough to make the necessary corrections.

Notes by the Way.

Docking horses tails.—Some sixty odd years ago, we remember seeing a pair of short-docked horses, drawing a lady's chariot, drive up to our door. This was an uncommon sight in those days, the fashion having given out with tight—Oh! so tight leather breeches, Hessian boots, and pig-tails, and a very ugly, cruel fashion it was. It doubtless originally obtained vogue in the reign of Charles II, as we find it mentioned, as being common, in "Markham," Frank Osbaldiston's ignorance of which author was so much scoffed at—ironically—by Die Vernon, as all who have read "Rob Roy" will remember. The childish idea was, "that the taking away of those joints must make the horse's spine a great deal stronger."

Its revival in the last few years is hard to account for. Can it be that our stablemen are too lazy to take the trouble to clean the longer tails, and therefore persuade their employers that their horses quarters look better without nature's fly-whisk? A sheep's tail is necessarily docked, as a protection against the fly, and the operation adds to the beauty of its "legs of mutton;" but we do not eat horse-flesh much, as yet, and no one of any real unbiased taste will deny that, as a general rule, a well carried switch-tail, reaching about half-way down to the hocks, in a $\frac{3}{4}$ bred, or quite to the hocks in a thoroughbred, is a graceful appendage at all seasons, to say nothing of its useful quality in summer.

Dr. George Fleming, C. B., a well known veterinary surgeon, in a most elaborate article on "The Wanton Mutilation of Animals," published in the "Nineteenth Century Review" of March last (1895), attributes the revival of the barbarous custom of tail docking to "the popularity of the game of polo. Sidney, another well known author, remarks that, "though the docking of tails and hogging of manes have been revived by polo players, polo-ponies are not treated in this manner in India;" and then he goes on to say—most angallantly:—"Like crinolines and chignons, it is a beastly fashion, and cannot last for ever." Well, we hope Sidney is right; but one thing is certain: the tail once docked can never grow again, so we are in for at least a dozen years or so of curtail horses.

By the bye, Dr. Fleming, from arguing from particular to universal, falls into a monstrous error. Judging from the row made about the horses sent by the women of Canada to the Duchess of York, last year, having been docked, without the senders knowledge, he says: "The fashion is not tolerated in Canada." Isn't it? Immediately after reading these words, we sallied forth to look over the teams of the Sherbrooke street *richards*. It was about 4 o'clock in the afternoon; very fine and bright, and the drive was, well, one might say, crowded. At least 45 carriages were passing backwards and forwards; *all, except one, were drawn by short-docked horses.*

The Kennel.—The Canadian Society for the prevention of Cruelty to Animals has issued the following circular to the kennel clubs of the Dominion:—

Montreal, March 26, 1895.

Sir,—I am instructed by the executive committee of the Canadian Society for the Prevention of Cruelty to Animals to call your attention to the annexed copy of a resolution passed by the English Kennel Club, and to earnestly request that you will bring it before the committee and members of your society, with a view to ascertaining whether they will not follow the excellent example set by the English Club. As you are probably aware, H. R. H. the Prince of Wales, both a keen sportsman and a lover of dogs, has written a letter strongly condemning the practice of cropping as both cruel and useless. The executive committee of the C.S.P.C.A. would also call attention to the fact that the pain of the operation, though bad enough when practised skilfully, is frequently greatly enhanced by being performed by untrained hands.

G. DUANFORD,
Secretary-Treasurer.

Resolution—'No dog born after March 31, 1895, nor Irish terrier born after Dec. 31 1889 (sic) can, if cropped, win a prize at any show held under Kennel Club rules.'

Fox hounds, in England, used to have their ears rounded; it was supposed to be as a protection against the furze bushes, thorns, and brambles in our fox-covers: they are no joke in the heavy countries of Notts, and the S. E. of England.

Treachery is not a quality restricted to the human race alone; as will be seen by the following lively description, beasts are as capable traitors as the vilest of Jonathan Wilds. (1)

Allen, a butcher in South-Audley Street, London, had a black sheep that was as bad in morals as Mr. Armour's Dick. This wicked deceiver used to accompany the drover employed by Allen to Smithfield Market every Monday, and when the purchases of sheep and lambs were completed, Tom, as he was called, trotted off home with the lot, generally some fifty or sixty in number, and, by the bye, all Suffolk downs. On arriving at the shop, Tom, taking the lead, coolly conducted his victims into the slaughter-house. As soon as the last sheep was safely in, the drover slammed the half-door to, and the noise was the signal for the perfidious Tom to run along the backs of his de-

luded dupes, and, springing over the half-door, leave them to the tender mercies of the knife.

A bovine diplomate.—Armour's decoy steer, meets his merited fate.—

'Dick' the bunco steer at Phil Armour's yards, got too lazy for his job and was led to the slaughtering pen just like the animals he had decoyed to death before. The deceitful old beast is dressed beef now. 'Dick' was a big, fat, brown steer that had winning ways and a cold, treacherous heart. Many and many are the confiding country yearlings and heifers 'Dick' has led up to the butcher's steel hammer.

Probably there never was a beef 'critter' that had so wide a celebrity as 'Dick.' Every visitor who went to see how the packing houses work had to have a look at this steer. Foreign princes and pretty summer girls have marvelled at the skill and diplomacy with which he steered the unsuspecting range cattle to the place of death. 'Dick's' picture has been printed in the papers many a time and columns have been written about the beast's crafty tricks. 'Dick' was just as much one of the sights of the town as the Masonic Temple, or the lake shore drive, or Policeman Steve Rowan. This is the way the creature got his notoriety:

When the long horns from Texas and the short horns from Missouri come into the stock yards and are unloaded they are naturally exasperated over their rough trip and are full of suspicion. The result is they are rebellious, especially in the matter of going into chutes. Now, unless a steer goes into one of the chutes in the packing house it cannot have its throat cut, and throat cutting is the aim and object of their coming to Chicago. So it is necessary to have a decoy steer, a crafty old beast, that can get the confidence of the rural beasts and lure them on to death and destruction.

Many years ago 'Dick' arrived at the yards, and being a beast of more than usually sagacious appearance was picked out for the work. 'Dick' was carefully trained in the art of walking up a chute at the head of a bunch of cattle and then quietly dodging to one side, leaving the bunch to walk on to the place where the hammers swing. After years of practice the big steer had grown expert at his treacherous work. 'Dick' would saunter down into a pen full of new and unsophisticated cattle and scrape an acquaintance with two or three of them. Then the wicked brute would begin to look wise and talk knowingly about the racy sights to be seen in the big white house beyond the fence. When 'Dick' offered to lead the way there was a grand stampede to follow. Up the gangway went 'Dick' and after him clattered the greenhorns. But just before the bunch got a sight of the big butchers waiting inside 'Dick' would unostentatiously shy off through a side passage and leave his victims to transact business with Mr. Armour's men.

So 'Dick' grew famous. But like many other famous characters he grew puffed up with pride, got lazy, and began to 'lay down on the job.' It got to be so easy, this thing of leading wide-eyed country cattle up into the chute, that 'Dick' didn't seem to care whether he worked for his feed or not. Mr. Armour grew displeased with his apathy. He does not like to have his employees loaf on their jobs. So orders were issued concerning 'Dick.' One day last week

(1) For the history of this scoundrel, see Fielding's "Life of Jonathan Wild the Great:" ironically so called, of course.

the wise old rogue was leading the usual bunch up the gangway, but when he got to the usual jumping off place there was none. 'Dick' had gone on with the herd. Before long he had been converted into dressed beef. Now that 'Dick' has suffered the same fate as his thousands of dupes his work all devolves on his former partner, known to the butchers as 'Phil.'

Fertilisation means, not the addition of manurial matters to the land, but the impregnation of one plant by the pollen of another, or of the ovum of the female by the semen of the male, in animals: it is all the same, as any one may see in the cucumber, melon &c.

Sacaline.—A letter from Monsieur Roy, of Emileville Q., who has tried this new plant, runs as follows:

"My friends and I, who have tried this crop, agree that we cannot recommend it: it has proved with us a complete failure. I set it out in my garden, as well as in other places, but in no kind of soil did it do any good, though I took the greatest possible pains in its cultivation.

In the garden, it grew about three feet high; at six inches from the ground it separated into two branches, and these were so hard that no beast could eat them, though their flexibility made them very suitable for whips.

I had to treat the plants with Paris-green, as there came an insect that ate all the leaves as fast as they burst from the sheath."

Altogether, we should not advise our friends to plant largely of this Siberian fodder-plant until our friend Monsieur Bouthillier, of Ste-Thérèse has completed his experiments with it: M. Bouthillier says, in a letter of the 16th March, '95:

Ste-Thérèse, March 16th, '95.

DEAR JENNER FUST,

I planted some seeds of P. S. in three flower pots on 3rd of March, and on the 9th there were two little 2 inches high plants up. I watered the earth every day, and kept the earth moist. The two shoots are about 3 inches long to day and there are 5 or 6 other ones about a quarter of an inch. They are in a window, with a south-westerly exposition. I shall only water them very slightly every two days now. I do not know whether they will come to anything or not, but I shall get more seed, and plant them every two weeks or so. I have sent the money, to Baltot, of France for some guaranteed plants, to set out in the spring. I do not think, that I can find out everything I want to know before a couple of years, as I should require 2 year old plants to experiment with satisfactorily.

I enclose a couple of letters, which please keep for me, in case I should want them for reference.

Mr. Roy's letter is not hopeful, but setting the experiments mentioned in the pamphlet against it, I do not feel inclined to give up until I shall have all the most carefully conducted experiments in connection with this matter during a period of a couple of years.

I have not been able to get satisfactory proof from the syndicate that, Mr. Roy, was supplied with guaranteed plants of *Polygonum Sachalinense*.

My experiments will be on a small scale, and as I do not want to throw away money, will take time, but I think not any longer, that would be necessary, to obtain reliable results one way or the other. I have requested

the Syndicate to get for me all the reports they can, from Messrs. Baltot, Doumet, Adamson, and others, in France. If the plant succeeds in France, I do not see, why it should not succeed in this country.

If you could obtain any information concerning P. S. from England, by writing to some one and only body that you would consider reliable, it would be useful.

Yours truly
C. F. BOUTHILLIER.

Alfalfa.—At our request, our friend, Mr. Lewis, wrote to his "Spanish" brother, as he calls him to ask him to send us the true meaning of the word "Alfalfa". He sends us the following in reply:

"Alfalfa is the Spanish for clover, and as far as I know was originally a Moorish word. It is not pure Spanish, although the only word used in some parts of Spain. In the North of that country, the word *trebol* is sometimes used, but in Valentia and the South, Alfalfa is the word."

Of course the word *Alfalfa* is a compound of *Al* the Moorish definite article, and *falfa*, so we suppose *falfa* must mean clover generically, and *Alfalfa*, the clover, emphatically; just as *alcohol* mean the quintessence; *alguazil*, the magistrate, i. e., the chief magistrate. The Moors colonised and governed Spain, more particularly the Southern parts: hence this language passed more into common use in that region.

Trebol, as clover is called in the North of Spain, is of course *trebol*, i. e., three-leaved, and *falfa* are constantly interchanged in Spanish words derived from the Latin, such as *trifolium*.

We have received the following from Mr. Saunders, the Director of the Experimental Farms of the Dominion.

Distribution of Samples of Grain from the Experimental Farm at Ottawa.

To the Editor of the
"Journal of Agriculture."

During the past eight years samples of those varieties of grain which have succeeded best on the Experimental Farms have been distributed on application in 3-lb. bags to farmers in all parts of the Dominion free through the mail. The object in view in this distribution has been to improve the quality and character of these important agricultural products throughout the country. This work has met with much appreciation and a considerable degree of success.

Last year I was instructed by the Honourable Minister of Agriculture to forward, as far as practicable, two samples to each applicant, but the applications received were so numerous that on this basis of distribution all the available stock had been promised by the middle of February, and all later applicants could not be supplied.

This year my instructions are to send one sample only to each applicant, with the hope that with this limitation every farmer in the Dominion who so desires may share in the benefits of this useful branch of the work of the Experimental Farms.

The distribution now in progress consists of some of the most promising sorts of Oats, Barley, Spring Wheat, Pease, Field Corn and Potatoes. Already more than 7,000 applications have been filled. All farmers desiring to participate in this distribution

should send in their applications early, and state which of the above named samples they would prefer, and their wishes will be met as far as practicable, until the available stock is exhausted. The grain can be sent early, but the potatoes will not be distributed until the danger of being injured in transit by frost is over. Letters addressed to the Central Experimental Farm may be sent free of postage.

WM. SAUNDERS,
Director Experimental Farms.
Ottawa, March 11th, 1895.

Disposal of garbage.—What becomes of all our refuse throughout the country? In Montreal, and perhaps in Quebec, the rubbish is collected and burned; but when thus treated is it utilised? We really do not know, and we should feel grateful to any one who would give us full information on the subject.

At Birmingham, England, great pains seem to have been taken to utilise the refuse of that populous town.

Each house is supplied with a specially designed ashtub for kitchen garbage and other solid refuse as well as ashes; and the contents of these are emptied into a box attached to the van that removes the 'pans.' The whole work is organized by districts with perfect system. There are several receiving stations, all situated on canal wharves. The coarser garbage is consumed in furnaces, of which there are about fifty in operation. The fine contents of the ash-pits are mixed with a portion of the contents of the closet pans, forming a fertilizer that is removed by the canal-boats and sold to farmers. But most of the material from the pans is made into a dry, powdered fertilizer by evaporation in special machines. The heat derived from the burning garbage suffices to work the evaporating machines. The 'poudrette' fertilizer is sold at \$30 a ton. The residuum of the incinerated garbage is a mass of 'clinkers', useful for concrete or mortar, for road-making, or for filling low ground. All in all, Birmingham has evolved a most complete and satisfactory system for the public management of every form of waste material—a system adapted in all parts to the actual conditions of the place. From Shaw's 'Municipal Government in Great Britain.'

FARM WORK FOR MAY.

Now, indeed, our work begins in earnest: happy is the farmer who has everything ready for the start.

A busy time for all; the cows have lately calved, and the *spes gregis* require no end of attention, for it is not difficult to guard against the scours, but when once a calf is attacked by that malady, it is not so easy to cure it. Thrice a day feeding, at least, with full-milk at first and then with skim-milk and linseed-meal, given at the natural temperature of the cow's body—96° F., or so—will generally answer the purpose. A greedy feeder should be checked, and made to take its milk at three or four goes. A few oats, with some good fresh clover-hay for the young ones to pick at when so inclined will keep them easy between meals, but this will not be needed for the first month. Do not turn them out to grass too soon; for the wind is often in the East during this month, and a dash of rain with a chilly wind will often cause the young ones to set to

work coughing, and throw them back considerably. We do not want people to think that stock-calves should be fattened, but we never saw a stunted calf make a profitable cow. All stock on the farm should be kept in an improving state until they reach maturity. And, after all, the final appearance of the cow herself—on the butcher's block—must be borne in mind.

Ewes will have mostly done lambing; and here we must reiterate our advice that all male lambs, not intended to be kept for stock, should be castrated at ten or twelve days old. A few mangels or swedes may be in store, and no stock will better pay for their expenditure than the ewes.

In this province, it is not wise to let the cattle or sheep on to the pastures till late in this month. Nipping the first young shoot of the grass does incredible injury to the yield of the entire season. Another thing to be attended to is to make no sudden change from dry food to grass; a couple of hours range once a day for the first week of pasturing, with a continuance of the usual winter food at other times is the best plan.

Your horses will have long hours at work and you will of course feed them proportionately: three bushels of oats a week with the best of timothy will be none too much, and a cold bran-mash on Saturday nights will keep them in good health. For 14 years, in our English home, with a stable of sixteen horses of all kinds, from hunters to Welsh ponies, we never had a vet. called in, and we attribute much of this immunity from disease to the weekly mash.

The horse that is mashed on Saturday night must not be driven to church the next day and left standing for a couple of hours in a windy shed. He should enjoy his rest at home.

One of the first things to be sown, as we are now a dairy-country, is green-fodder crops. A succession should be put in every fortnight from the very earliest date on which the land can be worked until, say, the first of July. We still adhere to our old recipe, which has proved so effective at Sorol, and, we are happy to say, has been recommended, under the name of "Mashley," i. e., "maslin," by the authorities at the Provincial Farm, Truro, Nova Scotia:

MASLEY. (1)—A piece of land containing 1½ acres was sown with a mixture of vetches, pease, and oats. This was sown in three lots. The first lot was sown on May 11th, the second on the 21st, and the last on July 2nd. This piece had a light top-dressing of stable manure. It supplied a large amount of excellent feed at a time when it was very much needed. We began cutting the first lot on July 9th.

Quantities: 2 bushels of oats, 1 of pease, and 1 of the large spring vetch, or tare. A couple of pounds of rape an acre, rolled in after the oats, &c., and harrowed in, would thicken the bottom growth after mowing and give some food for sheep in the fall.

No tares or pease intended for green-meat should be mown for stock until in bloom, and at least 6 hours must be allowed to elapse after cutting before the cattle are fed, lest they get blown.

A mixture of 2 bushels of tares and 3 pounds of rape, to the acre, will be useful for the ewes and lambs. This should be ready for feeding off by the middle of July, and when done the

(1) From the French *méier*, to mi. Bb

land should be ploughed, harrowed and sown with rape, at the rate of 6 lbs. to the acre: this will come in very opportunely about the end of September for the woaned lambs, and if a little clover-chaff with a few pease be given in trough, the lambs will soon be ready for the fall-sales.

Fodder-corn, for silo or green-meat, may be sown at any time after the land has got warm. We do not pretend to be an authority on corn, but, from what we have seen, we do not think it wise to sow this crop too thin: bulk is what is wanted more than quality, which latter can be supplied very easily by any of the nitrogenous feeding materials, such as pease, cottonseed cake, &c.

By the latter part of month, the mangels and carrots should have been sown, and some of the swedes as well. The difference in weight of crop between early and later sown swedes in this province is something remarkable. We do not in the least exaggerate when we say that the difference is quite 25%. We have watched the swedo-crop on M. Séraphin Guévremont's farm at Sorel for so many years that we are thoroughly convinced of the truth of the above assertion. The quality is not so good, of course, but only conceive the addition of 25% to his average yield of 1,000 bushels an acre: 1,250 bushels are not often seen on an acre of the best and best farmed land in Scotland, and, in our own part of England we should call 600 bushels a good crop.

The *mizens* in the field intended for roots will have been, of course, well pressed down by the carts that draw out the dung being passed over them while building. Ten days before they are needed for use, they should be turned; and while turning, all the outside should be thrown into the middle, and every lump broken up with the fork. One great reason for the quantity of weeds to be seen on our farms is the omission of turning manure-heaps: a sharp heat kept up for two or three days, will settle the bash of most seeds: the process pays.

If you have not rolled and brush- or chain-harrowed your meadows, do it at once, always provided the land is dry enough. A heavy roller, though not many are to be seen here, is one of the most valuable implements on a farm.

When the swedes and mangels come to the hoe, do not be afraid of cutting deeply into the ground. (1) If they are sown on drills, pull the drills down level with the space between them, and leave the plants as nearly naked as possible. But this will be work for a later month.

THE ADVANTAGES OF A VARIETY OF CROPS

(Continued.)

By THE EDITOR.

Flax.—If we are to sow flax, we must first make up our minds for what purpose we intend to grow it: for its seed alone; for good fibre and a fair yield of seed; or for fine fibre, for the manufacture of linen, cambric, &c., and an inferior yield of seed. Upon these three points will depend the quantity of seed used to the acre.

We may as well say at once that we have grown this crop very successfully in England, and what we shall state here in describing its cultivation is entirely derived from our own practice.

(1) This does not include the sugar-beet. Ed.

Soil for flax.—The best soil for flax, as for pretty nearly everything else, is a moderate light loam. The best crop of this textile we ever grew was on a fine gravelly flat; alluvial deposit; on the banks of the river Cam on the borders of Essex and Cambridgeshire; the previous crop was wheat (44 bushels to the acre), but the land was full of dung and had never been hard worked. The rule used to be never to manure for flax directly, but if a dressing was considered necessary it was given to the antecedent crop. The flax we are now considering was sown for the 2nd purpose mentioned above, viz., for a fair crop of seed and a good quality of fibre, though not so fine as the lace-makers of Valenciennes, &c., require for their delicate work. It is probably a superstition, but the great Belgian and French-Flanders flax growers persist in asserting that no good flax can be *retted* except in water from the river Lys.

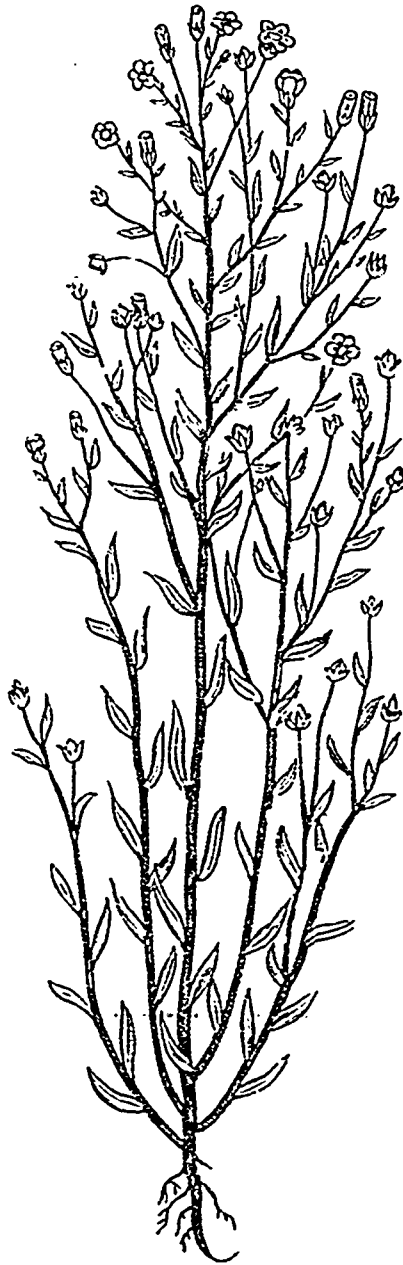


FIG. 1.

Preparation of the land.—As we said above, no dung should be applied to the land for the flax-crop when good fibre is desired. Perhaps the best precursor of this plant would be a heavily manured crop of potatoes or roots. After the removal of the roots or tubers, the land should be ploughed a moderate depth, say, six inches, the ridges as wide as possible, being made quite flat, that is, not rounded in the least, and the water furrows most carefully drawn out. As in this high-waged country hand-weeding is out of the question, we must do our best to clean the land thorough

ly before sowing; therefore, when spring arrives, we must work the grubber and not the plough, by which means the stale-furrow surface will be kept constantly in its place, and no fresh weed seeds be brought up from below. Grab two or three times at intervals of a week or so, and in this way what seeds of weeds lie near the surface will sprout and be destroyed as fast as they show their first leaves.

We may do well to mention here that the reason we advise the ridges to be made broad and flat is, that it being a very important point at harvest to keep the flax as much as possible in bundles of the same length, if the ridges were ploughed narrow and rounded, the plants growing on the lower parts of the ridges next the open-furrows would be much shorter than the plants on the crowns, and it would give no end of trouble to obtain anything like uniformity of length in pulling the crop.

Seed.—A great deal depends upon the seed: the best we used to think

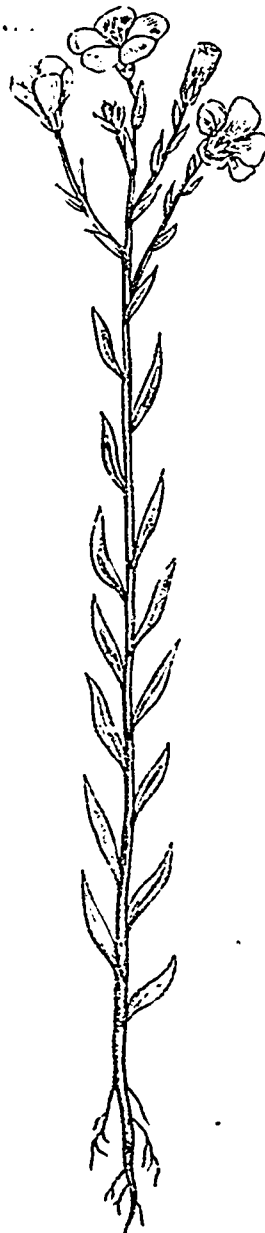


FIG. 2.

was Riga seed, once sown in Belgium. It should be heavy, plump, and bright. We have seen very good linseed at Sorel, but more care must be taken in cleaning it than the farmers there seemed to think worth while.

As for quantity, if rather fine fibre is wanted, 2½ bushels an imperial acre will not be too much, but for both seed and moderate fibre, 2 bushels may do. What you want is to prevent branching: it gives seed, but also coarse fibre.

Season.—When the maize is sown is about the time for sowing flax: the land should be warmed first.

Sowing.—Flax requires a firm seed-bed; after the last grubbing, harrow till the land is pulverised all over, no holes or rough places must be left; roll when the harrowing is finished, and then sow: but here comes the trouble. Linseed is, as every one knows, the most slippery of all grains; it must be mixed with something that the hand can catch hold of, and the best thing, we think, is road-dust well sifted. The seed should be moistened before mixing with the dust; it must be sown broadcast at any rate—never drilled—and perhaps the ordinary broadcast sowing machine would do, but as we never tried one of them for this purpose we cannot say. At all events, the hind grubber teeth of this machine, if it is used, must be taken off, as the seed must not be buried deeply.

When sown on the freshly harrowed surface a pair of light seed harrows will bury the seed deep enough, and a good heavy roller finishes the job.

Harvesting.—When the straw, next the ground, begins to turn yellow, and the seeds to change to a pale brown colour, the flax is ready to pull. In pulling, the same lengths of straw should be kept as nearly as possible together, and the sheaves should be made small, say, about six inches through, as it makes the after-process of "rippling," i. e., pulling off the seed-bolls, more easy, the small sheaves not requiring to be opened out for that purpose. The sheaves should now be put into shocks, like wheat, to dry.

In England, we used our ordinary machines to thresh the flax; but there, the mouth of the feeding place is made 5 feet 6 inches wide, so the straw to be threshed is fed in at full length sideways, and is delivered utterly unbroken and as straight as an arrow. Here, our machines would smash it up into tow, and make it worthless for any fine manufacture. We must *ripple* it thus: the small sheaves are repeatedly pulled through an upright iron comb with round teeth, about a foot high and ¼ of an inch apart, with blunt, tapering points. The *ripper*, seated, spreads the small sheaves, draws the ends through the comb, as his assistant hands them to him, and the bolls falling to the ground or into a box arranged handily, can afterwards be threshed, and the seed put away after being winnowed. The flax itself is now be considered ready for the after process of "retting," beetling, and scutching, though it would be much improved by being kept in stack till the warm weather of the next season arrives.

Where the *linseed* is consumed at home, as it ought invariably to be, there is not use in threshing out the bolls, as if mixed with a fair amount of oats and pease, they will grind up famously, and help to prevent any of the oil from escaping. About 2 bushels of pease, 4 bushels of oats, and 2 bushels of the bolls, make a good mixture, which, after turning up with chaffed straw, damped, will make good milk, or fat, tender beef and mutton.

In our time, we sold the flax in the sheaf to a London Company that had a factory fitted up after the plan of the Chevalier Claussen, a Belgian. Here, the flax was *retted* in warm water, beated, scutched and finished off by machinery. If we remember, the price was \$15.00 a ton, and seed and straw brought us in about \$45.00 an acre; but it is a long time ago—1854—and we have no notes on the subject. Here we should think, at first, what is called "dow-rotting" would be the easiest plan: the flax spread

out thinly on the grass, and turned frequently, until the fibre parts readily from the woody stem, when it is ready for the beetle. It takes at least a month. If, however, flax should be grown to any extent and enterprising farmers should show that they are capable of turning out samples of really fine fibre, no doubt a market will soon exist for the straw in its natural condition. We saw in the papers, two years ago, that, at Dundee, Scotland, the straw was treated mechanically by a machine then recently invented for the purpose, and that fully three-fourths of the crop grown in Fifeshire was disposed of to the factory at prices which left a better result than any other crop on the farm. There must be plenty of firms here which would introduce it into the province as soon as it can be shown to be worth their while.

This article could have been spread out to ten times its length, but we think we have said enough to show any one who cares to embark in flax culture how to set about it. Note.

1. Pull flax, do not mow it;
2. Knock the dirt off the roots by a kick, or by striking it against the ground;
3. Before tying, lay the two handfuls across one another.
4. Never sell the linseed, but use it for your stock.

ENGLISH CROPS.

The "Averages returns" of English crops of different kinds in 1893 and 1894 were as follows: the weights &c, are given in Canadian weights &c., and the sterling converted into currency:

Potatoes—bushels of 60 lbs.	216.50
Clover and other sown grasses.....	3,136 lbs.
Meadow-hay.....	2,688 "

Yield of grain in 1894:

	Bushels.
Wheat.....	30.7
Barley.....	34.6
Oats.....	44.6

Average yield of grain during the 10 years from 1885 to 1894, both inclusive:

	Bushels.
Wheat.....	29.3
Barley.....	33.1
Oats.....	40.6

The average yield of wheat in Scotland in 1894 was 37.1 bushels, and for the 10 years from '85 to '94, was 35.3 bushels. But very little wheat, comparatively, is grown in that country; several counties grow none at all, and in others only a field here and there of the best land is put into wheat.

Lime.—The effect of lime on the mechanical condition of clay land is very remarkable. It coagulates clay into small particles, between which moisture finds its way.

"If some clay soil is put in a funnel and water allowed to flow steadily through it, it will drop through bright and clear for some time, but by and by the drops become muddy and continue so until the clay is all washed away or the funnel is choked up with mud which refuses to let the water flow. If while the muddy drops are falling a little lime is sprinkled on the surface of the soil the drops soon begin to fall clear again and continue to do

so until the lime is again washed out, when the clay will once more flow away rendering the water drops muddy. This is a little experiment which any one can try for himself, and it conveys a great amount of information. When rain falls continuously on clay land it soon ceases to be absorbed, if the land is flat it becomes covered with muddy pools, but if it is steep the water runs down in streams, carrying the finely divided soil along with it. What has occurred here is exactly what occurred in the experiment referred to. The excess of rain has washed away the lime and other salts from the superficial layer of the soil, and its porous granular condition has been changed into a muddy one, and long after the rain has ceased, this muddy condition remains until, by capillary attraction, lime salts come up from below and cause the mud to cohere into fine granular masses, through which water can once more drain away freely. Other salts also possess this character to some extent, but none to so great an extent as lime."

THE DEVONSHIRE SYSTEM OF BUTTER-MAKING.

At the meeting of the Council of the Devon County Agricultural Association, the Secretary (Mr. Winter) read the report of the steward of butter-making contests at the recent Exeter Show (Mr. J. E. Bovey), who stated that the competition was practically a duel between the old-fashioned Devonshire method of "tub and hand" and the latest scientific developments carried out by the aid of the churn. The results of the contests had demonstrated in the most remarkable manner the extraordinary superiority of the Devonshire method of "tub and hand" over any other system, both as regards the weight and quality of the butter which was produced. His remarks were based upon the results of the open competition for scald cream butter, which took place on the first day of the meeting. Competitors were allowed to make the butter in any way they chose. A summary of the results obtained by the rival methods worked out as follows:—

1. Taking the whole number of the competitors, i. e., 20—

(a) Average weight of butter made, 6 lb. 12 oz.

(b) Average time taken by the whole, 1 h. 25 m.

Separated into the two systems of "churn" and "tub and hand," the following remarkable figures were obtained:

TUB AND HAND.

(a) Average weight of butter made by competitors, 7 lb. 2 oz.

(b) Average time taken by them, 49 min.

CHURN.

(a) Average weight of butter made by competitors, 6 lb. 5 oz.

(b) Average time taken by them, 2 h. 5 min.

So that by the old-fashioned Devonshire method of "tub and hand" there was a difference of saving of 1 h. 16 min. on the time occupied in the making by each competitor, and an excess of 13 oz. in favour of "tub and hand" as regarded the weight of butter made by each. Given equal degrees of quality and saltness, he maintained that the Devonshire method of "tub and hand" would prove infinitely superior to any other as regards weight, quality, or the time occupied in producing it.

THE REARING OF SHIRE HORSES.

The Chairman then introduced Mr. H. Horroll, of Peterborough, who had promised to lecture on the "Breeding and Rearing of Shire Horses." Mr. Horroll said as his friend Professor Blundell had invited him he would try to lay before them a few facts that he had collected from amongst his neighbours in the Fen district, where shire horse breeding was one of their greatest helps, and for which the Fens were so justly famed. The breeding and rearing of shire horses had made such strides of late, and had reached such a high standard, that a good pedigree was of as much value as the pedigree in short-horns was forty years ago. In these days he contended that they must make a study of pedigree if they wished to be successful in getting the right class of animal. Farmers were very much indebted to those gentlemen who compiled the first stud-book. There were now 15,438 stallions, and 19,159 mares registered. In forming a stud of shires, gentlemen of means had many advantages over a tenant-farmer, who had to look at every penny he spent; they could at once buy the best mares, and so get the most fashionable blood in a short time, but a farmer must content himself with breeding from the best mare he had, and using the best sires he could find in the district. In selecting mares to breed from, which was a point of the utmost importance, it was considered that a mare should be long, low and wide, with good flat bones, broad feet, and nice silky hair, and, of course, free from hereditary disease as possible. A stallion could not be too big, provided he was made well in proportion, and should stand 17 hands high, have massive flat bones, measuring 11½ to 12 inches below the knee, short legs, and possess good-shaped feet, broad at the heel, hocks of good shape, his ribs should be well sprung. He advised that a good waker should always be selected. It was always important that a mare should be properly mated. If a mare were deficient in bone and hair they should use a sire that was coarse. It was generally considered that the sire was the most impressive parent in forming the outward shape of the offspring, and the mare the constitution. He advocated breeding from fillies when two years old, because if they were fortunate to get a foal the mare would have an extra year's run, and so often grow and spread better than those that have been hard-worked during the same time. Many objected to this practice, but since breeding and rearing young stock paid so much better than growing corn at its miserable price, they could not afford to lose one year with their producing animals. Young mares produced the best stock, and were more likely to continue doing so. If breeding from an old mare he recommended a young sire; she was not only more likely to breed, but the produce would be better. Mares kept steadily at work on a farm generally had better luck than those kept idle, and for show purposes many breeders were most anxious to have early foals; they had a much better chance of winning in a show-ring; but at the same time it was the ruin of many animals. A farmer did not want his foal to come till he had finished his spring seeding, and foals that came in April or May, and went out to grass in a fortnight, were generally more healthy than those foaled in February and March. In some districts gentlemen who were rich allowed their tenants the use of their stallions, and this was a great boon; but where this

advantage did not obtain, he recommended the farmers of a given neighbourhood to club together, and hire a stallion for the season. This was done at Peterborough, and was a great success. Mares were best at gentle work up to foaling; there was more danger from feeding and idleness than hard work. The mare should have a loose box at night, and ought to become quite used to the place before they were due to foal. At such times only hay should be given them to eat at night. Some insisted on giving mares chaff, or corn, or pulped mangolds, and the result often was great difficulty in foaling, and sometimes the loss of the mare. Foals were awkward things to learn to suck, and generally did better when left alone. When foals came before their time they often lay and slept for days. At such time they ought to be roused up every few hours to prevent their limbs getting stiff and cold, and they could not get up themselves. Foals were tender animals in their youth, and required much care especially if they came very early. If they took cold they soon died. Mares were more likely with abortion at the sixth month, therefore greater care should be taken with them about that time. They should never work in the shafts. Colts and fillies should be separated in June, as they did not rest well together after that time. It was contended that railways would do away with the demand for draft horses, but the fact was that the demand was greater than the supply. Merchants and brewers could do without them in large towns, and there continued to be a strong demand for big strong horses for town work for years to come. Shows had done a good deal to increase the value of horses, and a good animal commanded a good price. He advocated local foal shows so that farmers could compete amongst themselves. He depreciated the dangerous practice of giving horses drugs to make their coats shine instead of a little linseed crushed, and plenty of elbow-grease.

TORONTO WOOL-SHOW. FLEECE WOOL.

5 Fleeces—Washed or Unwashed.

	Teg. (1) Ewe.			
	1st	2nd	1st	2nd
Coarse Combing wools (Cotswold Type).....	\$7.	\$5.	\$7.	\$5.
Medium Combing wool (Lincoln and Leicester).....	7.	5.	7.	5.
Medium Fine (Shrop, Dorsets and Oxford Types).....	7.	5.	7.	5.
Super (Southdown).....	7.	5.	7.	5.
Fine wool Merino	Grades.. 7. 5. 7. 5.			
	1st 2nd 3rd			
Clothing Fleece (White from Grade Sheep).	\$7.	\$5.	\$2.	

Teg to be first clip from animals of either sex; ewe to be from ewes and to be the second or subsequent clip.

Prizes for fleece wools to be competed for by breeders or farmers only.

Exhibitor to certify that he is the breeder of the sheep from which the wool was shorn, that they have since been in his possession and giving details of breeding.

Judges to specially note evenness of growth, uniformity and quality of staple.

(1) Teg is the same as hog or hogget, i. e., a lamb of last year before it has been shorn; when shorn, it becomes a shearling.—Ed.

Correspondence.

Calumet-Island, 6th April 1895.

Dear Mr. Editor,

Would you be so kind as to give me a little advice on what breed of cattle would be best to raise in this part of the country. We have lots of pasture land and send milk to cheese factory; also sell beef cattle very well when they are large enough &c. Is there any one breed that would answer all those purposes or would it be better to have two breeds. Our Farmers' Club intend to buy a two year old bull of some breed this spring so I thought you would be the best authority to inquire from and I being a subscriber to your Paper for two years and liking it very well. I thought I would ask you. I am writing to some of the parties who have advertised in your paper so I will wait until I get an answer from you before buying. Also, if any dealer that you are acquainted with that you might be talking to wished to write to me and let me know their price and how much it would cost to have him sent to Campbells Bay Station P. P. J. K. R. we might make a bargain.

Your truly,

JEREMIAH SHEA,

Calumet-Island,
Province of Quebec.

If you thought an answer to the first part of my letter would be of any interest to the readers of your paper it might be good to put it in next issue. (I should like an answer in private immediately.)

Answered, recommending Ayrshires and a Guernsey bull.—Ed.

Horse-hoeing.—There has been a good deal of discussion lately, in the agricultural papers of the States, on the question of deep, or shallow, horse-hoeing. The question seems to us to be very easy of solution. It depends entirely upon the kind of plant to be treated whether the work should be done deep or shallow.

Take, for instance, corn: in its early state the roots are short and the deeper the hoeing is done, the more land is stirred and the greater the aeration it receives. But, when the corn has arrived at a certain height, the roots have prolonged themselves until they meet across the interval between the rows, and the horse-hoe necessarily, if worked more than a couple of inches below the surface, cuts them in pieces. What is the consequence? The "vis medicatrix," or healing power, of nature goes to work at once to cicatrize the wounds; more rootlets are immediately protruded from the lacerated parts; and the energy that should be occupied in promoting the ripening the grain is thus devoted to another purpose, and the frost is with us before the perfect development of the plant is attained. This we discovered to be a practical truth as long ago as 1867, and, if we remember, spoke of it in one of the earlier numbers of the Journal.

But with roots and potatoes it is not so. They do not spread their roots like corn, and there is no danger of their not attaining maturity; therefore, the horse-hoe may work as deep as you please and as long as you please until the implement and the horse that draws it are likely to damage the leaves.

"SANITATION."

In these days when sanitary science is so important and the fact is demonstrated that the health of communities depends as much upon their surroundings as on the food they eat, it appears that it would be useful to call the attention of the rural population to the frightfully insanitary condition of their premises in too many instances. As to cattle, a great deal is said and written upon the best methods of feeding what is a balanced ration and the like, but not much on the vital question of the arrangements of their dwellings, the air they breathe, the water they drink or the light they should enjoy. Food however well prepared, or however judiciously administered can never have the same salutary effect upon an unhealthy weakling, as upon a creature in the full enjoyment of health and appetite, therefore this question of hygiene is, or should be the first to be considered. But alas what do we too frequently find. First, not the least attention given to drainage, but the liquid manure allowed to mix with the water that falls from the roofs of the farm buildings, either to become stagnant and poisonous in the immediate vicinity of the homestead, or filter its death-dealing impurities into the pond or puddle at which the cattle drink.

Then, we find the barns constructed, as it would appear, without the slightest thought for the health of their inmates. Insufficient space—no 1000 cubic feet of breathing room as is insisted upon in some large cities where sanitary regulations are well observed, but in many a barn can be found poor creatures breathing the same air over and over again in a space, not over half that size, and without any means of ventilation except by opening the door, which is impracticable for any length of time when the thermometer is below zero.

Light is admitted only by some little portholes and the idea that, it too, is as necessary to healthy existence in a cow as in a man never seems to have entered the heads of the builders of these miserable cattle-jails.

We should never forget that the free access of light is necessary to the healthy development of the higher orders of both plants and animals, while the darkness favours the condition of the disease engendering bacteria, which "love darkness rather than light because their deeds are evil."

Feeping the manure in a cellar under the cattle is another practice which, unless the floor is very water tight and air proof must have a vitiating effect upon the atmosphere, and, even if the floor is carefully made in this respect, injurious fumes will arise when the traps are open to put down the manure. The quantity of carbonic acid thus generated would be sufficient to produce lassitude and enervation, to say nothing of the millions of disease producing microbes which inhabit foul air—hence the necessity of thorough and complete ventilation.

Then, where dairy cows are kept what criminal neglect do we notice as to keeping them clean?

The construction of the floor on which they stand is such that they are compelled to remain in their own manure a great part of the time, until the poor creatures hips are plastered with it, especially if it is not frequently removed, a matter which is too often neglected. Then most farmers would consider it a waste of time to

use the curry-comb (1) on their cows where it is quite as essential to their well being as their horses. I know some will say "this is nonsense and we never could have the time to treat our cattle thus": whatever is worth doing at all is worth doing well, and time is not lost in work which pays as this will, in the improved condition of the stock the securing of the milk in a perfectly pure state and the satisfaction that the animals entrusted to our care by a kind Providence are enjoying themselves as well as circumstances will permit: a feeling which, the merciful man who is merciful to his beast will find no inconsiderable source of happiness—and will make his occupation as pleasant as it will be profitable.

The stanchion which prevents the poor creatures from turning round over to lick themselves, is a barbarous device; (2) we don't want to treat our cows merely as machines in which we place certain materials for the elaboration of milk, but as living creatures whose comforts should receive our consideration.

Is it wise to keep our cows in the same spot without any exercise all winter? Some of our dairy men advocate the cows to be allowed to run loose altogether. There is no doubt but that a proper circulation of the blood is dependent upon some exercise and without this the lungs can not properly perform their functions and pulmonary disease is likely to supervene.

The force of habit is so strong upon us that these considerations are apt to be overlooked or disregarded as of no moment, whereas the improved sanitation of cities has had a marvelous effect upon the health and moral tone of their populations, and if we can induce our farmers and dairy men to pay more attention to the importance of this subject, we can improve their chances of prosperity as much as by trying to explain to them the best rations and how to feed them.

I believe too that the morals, so to speak, of our cattle would be improved by better sanitary measures—and profitable as well as pleasant results would follow.—A cow like a human being, experiencing all the advantages of comfortable surroundings would be much more likely to be even tempered and pacific, a quality of the highest consequence in a milker. The necessity for what Dr. Wm. Horne (vide *Hoard's Dairyman* March 8th. 1895, page 53) calls barbarously murdering a cow by dishorning—"adding that" dishorning, excepting in the case of a vicious animal, is a disgrace to this whole country or any other country—would be avoided, and she would give us a good flowing pail of rich milk with a good will, and we shall have the consciousness that we have done our duty, humanely, and as the Providence who gave us Dominion over the beasts of the field would approve and reward abundantly.

Geo. Moore.

Ottawa 15, April '95.

DEAR MR. JENNER FOST,

I send an article, which I intended to have written on Saturday, but I had not time. It is on a subject of very great importance and one that affects our domestic Economy in Summer in a tender spot. It is one that is creating

(1) Brush, please, for neither horse nor cow should ever feel the dandruff-creating curry-comb.—Ed.

(2) *Hear, hear.* A well-licked cow or steer needs neither wisp nor brush.—Ed.

great attention and it is well that your well conducted Journal should have it first if you think it worth.

I hope to be in Montreal to address the Montreal Poultry Association next month and will have a day or two to spare. I then hope to have the pleasure of calling on you.

I am, yours faithfully,

A. G. GILBERT.

The Poultry-Yard.

About eggs—Where do all the bad eggs come from in Summer?—Partially hatched eggs on the market. How bad eggs come to be sold—What a farmer says.

(A. G. GILBERT.)

A matter of great importance to both farmers and purchasers of eggs, during mid-summer, was touched upon in the closing part of my last letter; viz.: the necessity of keeping the male birds away from the laying stock. It may be asked what are we to do with all the cocks? I reply do anything with them but allow them to run with the hens from which the eggs are saved, to be sold in the cities or towns for eating purposes, or, indeed for any purpose at all. The cockerels should all be killed and sold as soon as they are big enough. A fine healthy specimen should be kept to breed from the next season, or a bird might be purchased for the purpose. Should a cockerel be reserved to breed from, he should be kept by himself until he is mated with a certain number of hens in the early Spring time. In one of my annual reports under the sub-head "Keep the laying stock active" the statement is made "that the cock bird is a nuisance in the pen of layers, for, he not only monopolises most of the food, but, in many cases, teaches the hens to break eggs and so learn to eat them. Besides the stimulating diet is too fattening for him and will ruin him as a breeder." The hens are stimulated to lay by rations calculated to make the egg and shell, with as little food waste as possible. What is the cock fed such diet for? Surely not with the expectation of his laying eggs? But the practice is not a whit more foolish than the expectation would be, if entertained.

HOW TO SECURE VIGOROUS CHICKS.

Vigorous chicks—and every farmer should make it a point to have large, vigorous chicks—may be secured by the farmer selecting a number, say seven, or nine of his largest and best layers and mating them with a fine healthy male bird. If two years old hens are mated, a cockerel will give best results; if pullets are used as breeders, a two year old cock will produce the most vigorous stock. It is no difficult matter for a farmer to make a place to hold seven or nine hens for breeding purposes (allowing them a run outside) and with these hens put the male bird, which has been kept by himself during the winter season. When enough eggs have been saved for setting purposes, and, may be, some to sell if he has thoroughbreds, the cock bird should be sold, killed, or put away by himself, and the hens, after being kept enclosed for a week longer, should be allowed to run with the rest of the laying stock. By this course of action the chickens hatched will be strong, healthy, rapid growing specimens. Having selected his best layers, the

pullets will make as good layers as the parent stock. The cockerels, of course, should be killed for home or market purposes, as soon as fit.

PARTIALLY HATCHED EGGS ON THE MARKET!

Where do all the bad eggs come from? Where do the doubtful specimens, found by the thousands on the markets in summer time come from? Let me ask your city readers if they can buy eggs on the market, during the warm summer months, with any sense of security? Can they cook these eggs and put them on their tables with any degree of certainty? Let me ask your farmer readers if they know that a great many of the eggs they sell on the markets are partially hatched before they gather them from the nests, in which they have been laid? I do not mean to say that the farmer knowingly sells partially hatched eggs, or that he gathers such eggs in preference to new laid ones. But certain it is that farmers unwittingly sell thousands of ill flavoured eggs during the hot season. Last summer, we bought during the latter part of June and in July August and September, for our household use, sometimes four and six dozens of eggs at a time from farmers on the market. We paid twelve cents a dozen for them. Half were bad, making the price equal to twenty five cents per dozen. And most of the remaining half had not the flavour that a new-laid egg ought to have.

Where did all these bad eggs come from?

HOW BAD EGGS COME TO BE SOLD.

It must be remembered that I have said that the farmers have brought these eggs to the market unwittingly. Now, the causes of so many bad eggs finding their way to market in summer are not hard to find and I briefly summarise them as follows:

1. Not gathering the eggs once or twice a day.
2. Not having proper places for the hens to lay in.
3. Allowing the nests in which the hens usually lay to become infested with vermin, and so causing the layers to avoid them.
4. Allowing male birds to run with the hens and the eggs so becoming fertilised.
5. Allowing broody hens to set upon the eggs intended for market.
6. Collecting eggs from nests stolen by the hens, and selling such eggs on the market.

WHAT A FARMER SAYS.

There is a farmer in the neighborhood of New York, who sends thousands of new laid eggs every day to that city. He wrote an article to the *Rural New Yorker* some time ago in which he says: "After close observation I have no hesitation in saying that if a broody hen is allowed to sit upon a new-laid fertilised egg for only twelve hours that the flavour of that egg is ruined.

He also states that he hatches out hundreds of chickens by incubators and that after testing the eggs on the sixth or seventh day and taking out the clear or unfertilised eggs that he marks the latter and packs them separately to be sold for cooking purposes in the city.

All who use incubators for hatching chickens will tell you that at the end of twenty one days the unfertilised egg can be boiled hard and fed to the chicks.

It is also well known to those who practice artificial incubation that, at the end of the third or fourth day, no small advance has been made in the development of the embryo chick.

But I have quoted from a farmer, who does an immense trade in New York city, and who says that the flavour of a new laid egg after 12 hours incubation is ruined. And I believe him. His testimony should be important.

MORE CARE NECESSARY.

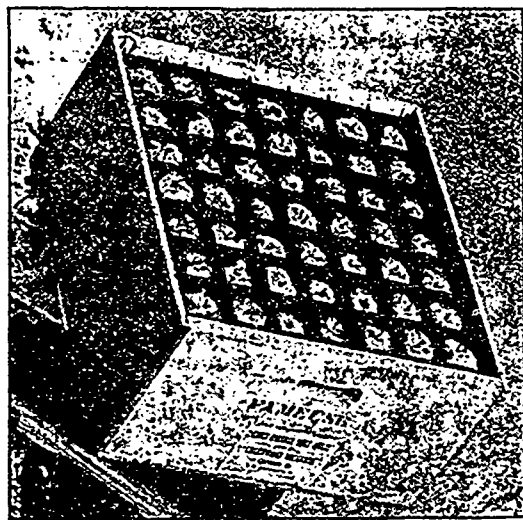
How many farmers see to it that their broody hens have a separate room to hatch out their chicks in quiet?

How many farmers are careful to see that broody hens have no chance to sit on new laid eggs, by gathering the latter soon after being laid?

It is evident that more care is necessary on the part of the farmer before we can have eggs in summer with the delicious flavour that new-laid eggs ought to have.

WHAT IS A BAD OR ADDED EGG?

A rotten or added egg is one in which the germ has started, but from some cause (may be, sudden change of a temperature, or shaking in transit



PATENTED BOX FOR FRUITS.

from one place to another, its progress has been arrested and decay sets in. Then you have the egg with a partially developed chicken in it or the germ in a more advanced stage than in the latter case and this sort of egg is not unfrequently met with. Cause of this egg being found on the market is that it has been taken from a newly discovered nest under a barn or hedge, from which a sitter is temporarily absent.

But time will not permit of a dissertation on the different sorts of bad eggs which find their way to market or shop.

I have hurriedly gone over a few of the points of a subject that is one of very great importance. It seems strange to say that it is a difficult matter to get a newly laid egg, on the market, in summer time, with the fine flavour that a new laid egg ought to have. But the fact remains and will so remain, until the farmers give the subject their careful consideration.

PACKING APPLES FOR EXPORT.

SELECTION OF APPLES, PACKING.

In sending apples to England, the only way in which they can be secured from bruising is to pack them in proper boxes. Most of our Quebec

apples are too tender in flesh and skin to stand packing in barrels without bruising.

The *Fameuse*, *Wealthy*, *Winter St. Lawrence*, *McIntosh Red*, &c., may be classed as late autumn and early winter fruit, and are in perfect order for the table between the 1st November and the middle of December. It is a vital error to pack such apples in barrels, for it is certain that when they arrive in England they will be found to be bruised or crushed.

In barrels, apples will hardly stand over a short journey, unless they be packed very tightly and the tops and bottoms of the barrels be pressed so firmly into the fruit that there be no rattling about; on the other hand, our tender apples cannot be packed in this way without getting crushed, and even the slightest bruise will soon cause rotting.

For the last ten years, I have adopted a patented box that has given me perfect satisfaction: See engraving.

In those boxes we even succeeded in sending *Duchess* apples in perfect order, last season, to Liverpool and Edinburgh. Autumn *St. Lawrence*, too, arrived in England in capital condition; but as this variety was not known there and the colour did not please the English, my agent did not return me much encouragement.

The *Wealthy*, *Red McIntosh*, and *Winter St. Lawrence* were highly appreciated. Their deep, rich colour pleased the buyers.

The best way of finding out the state in which the fruit arrives in England is to have agents there to watch the arrival of our apples.

The *Wealthy* and the *Winter St. Lawrence*, which I sent to my brother, in England, via London, about the 1st October, not only reached him in perfect order, but on the 7th December, when he wrote to me, were as firm and crisp as need be. This shows clearly the excellence of the compartment-box for packing this kind of fruit.

If the boxes are filled in the orchard, and the fruit carefully handled, it cannot be bruised or injured unless the boxes are flung about or smashed. I must say that, during the last ten years, great improvement is visible in the way boxes are dealt with aboard ship. For more than three years I have had no complaint to make.

The boxes weigh about 65 to 70 lbs. when full. They can easily be carried by putting the fingers into the slits at each end of the box: see cut.

Last year, I sent a good many empty boxes of this kind to orchardists in Nova Scotia, who wished to try them for exporting their famous

Gravensteins. I hear they answered perfectly.

Of course, the apples whose flesh is firm and hard enough to stand the voyage when packed in barrels, cost less to send, and most of these apples will for many years continue to be sent in this way.

The Tasmanian apples, which are sold in great quantities in spring and summer, are sent in long boxes, each apple wrapped in paper; and yet this fruit, that has several thousand more miles to travel than our Canada apples, reaches England in perfect condition.

If we Canadian fruit growers study the demands of the English market as earnestly as our exporters of butter and cheese have done, we shall soon see that it is absolutely necessary that our fruit should reach England without bruises or any other injuries.

R. W. SHEPHERD, JR.

Montreal.

The above is a translation of an article that appeared in the *Journal d'Agriculture* for January 1895.

Knowlton, Quebec, April 14th 1895.

MY DEAR MR. JENNER FOSTER,

Many thanks for your favor of yesterday. I am very sorry that my experience would not justify an article for the *Journal* on the system of feeding cattle only twice a day. I never tried it, but I must frankly tell you I never would, as I don't believe in it.

Yours always,

H. S. FOSTER.

HOW I BUILT MY SILO.

In the spring of 1894, I planted about one half acre of ensilage corn, with the intention of building a silo, if the corn grew well. Where the land was rich and the ground in good condition it grew very well.

It was not planted until the 10th of June, which was rather late. I was rather undecided where to build the silo and not wishing to take up any valuable space in the barn I decided to make it under the barn (battery) floor. The south side of the floor was about five feet from the ground, on good dry land. I excavated it six feet deeply and lined it up with boards to prevent the earth from falling in. I cut the corn as the ears were just forming, as it had been slightly injured by frost a few days before. After cutting, I let it wilt on the field a day before carting to the barn. There was no trouble in getting the cut corn into the silo as it dropped from the cutter into it. Rather than try any new plans, I thought it best to cover with boards and press with stones. In six weeks I opened it and commenced feeding. There were only a few inches on the top spoiled and some at the corners, as I did not take the precaution to fill up the corners with a corner board.

I fed to each cow about 25 lb. a day and also fed them hay and straw as much as they would eat. The result was that the cows kept in good condition and gave a good flow of milk for the whole season.

I write this to encourage the farmers in this part of the Province (*Bonaventure and Gaspe Co.*) where there are very few silos yet, and to show that it is not absolutely necessary to go to a very great expense to build them. Our Government, knowing the advantage they are to farmers,

wisely encourages their construction by giving prizes for them, one of which I obtained.

Hoping that many of our farmers will build them this year is the earnest wish of your correspondent.

N. JOHNSTON.
Black-Cape, P. Q.

The Dairy.

COW STALLS.

In the valuable work entitled "The Principles of Modern Dairy Practice," translated by Mr. F. W. Woll, and published by Messrs. Gay and Bird, 5, Chandos Street, Strand, London, there is the following reference to cow stalls:—

A too long stall may indirectly be the cause of infection of the milk. The hind-quarters of the cow will, under this condition, be soiled by the manure when she lies down. This is especially the case with the tail, to which particular attention must always be paid in cleaning the cows. The cow will often swing her tail during the milking, and if it is soiled, filth will, of course, be spread to all sides. I have found that the milk may in this manner be mixed with dirt of the most offensive kind. At a farm where the stalls are too short, and where there was no litter in the liquid manure gutter, the cows' tails were always wet and dirty; when the cows lay down their tails lay in the gutters, which did not thoroughly drain off the liquid manure. Although the gutters were new, holes and recesses had already formed in them, in which the urine and liquid manure remained and formed pools. By applying wooden shavings in the gutters the difficulties mentioned were later on avoided. The cows could then be kept clean, and the milk because as a consequence cleaner, and kept better than was previously the case. I have met with liquid-manure gutters of even worse defects than the ones described in a large number of stables in our country.

On another farm, considered a dairy farm *par excellence*, all the stalls were too short for the large fine cows, so that the hind-quarters and the tails always lay in the low gutter; the udders of a number of the cows were also dirty. What made the matter still worse was the fact that the stalls were lower than the barn-yard outside, where the manure-heap was placed. As a consequence the liquid-manure gutter was always full of urine. Only a couple of months after the herd came in from pasture, these sad conditions had conquered all the efforts of the farm hands to keep the animals clean to such an extent that hind quarters and parts of the udders were covered with a thick manure-crust, and the tails formed one solid, sticky mass. How impure the milk from this farm must have been may easily be imagined. I cannot give any exact data to what extent it was mixed with impurities, as I was not able to examine it closely; but, judging from the large quantity of slime gathered in the separator bowl when the milk was separated, it was as one would expect from its antecedents.

Conditions similar to those given above, although not carried to such an extreme, may be found on other of our "dairy farms"—i.e., on farms where they try, at least in the stable, to maintain a high standard of clean-

liness. What can then be expected of the cow-stables in the places where they do not try at all to follow the fundamental principle of modern dairying—strict cleanliness? The poor animals are kept in such places in undisturbed peace throughout the winter, uncarded and uncleaned; they are furthermore often confined in darkness for several months, as the very small windows are often wholly snowed or frozen over. Cow-stables where such bad conditions exist are still found in many places; and still people wonder that the milk coming from these primitive stables is of poor quality, and that the products made from it do not keep well.

LAWES ON THE WHEAT CROP OF 1894.

In my report upon the wheat crop of last year I expressed a hope that the average crop of the country would prove to be better than that indicated on the selected plots of the Rothamsted experimental field. The returns of the Board of Agriculture since published do, indeed, show a better result. Nevertheless, the aggregate wheat crop of the country in 1893 was the worst in point of quantity since 1879, and it was the worst in point of value in the present century. Our bad wheat crops are generally grown in wet summers, and under such conditions a deficiency of grain is frequently more or less compensated by a large amount of straw. But the crop of 1893 was even more characterised by deficiency of straw than of grain. Whilst people generally were rejoicing in the magnificent season, which from the beginning of March was one of almost perpetual sunshine and drought, the unfortunate farmer was left not only with scarcely any hay crop, but with hardly any straw for either food or litter for his stock, and the price of his grain fell to a lower level than it had ever reached before. Indeed, of the many bad years which the farmer has recently had to face, 1893 may, perhaps, be considered as upon the whole the worst.

It is fully recognised that the weather has a very important influence on our crops; but it is very seldom that we have two seasons in succession which show such remarkable distinctions in their influence on agricultural production. As the Rothamsted experimental wheat-field is cultivated as nearly as possible in the same way every year, the seed is sown as nearly as possible at the same time, and the same manures are applied to the same plots year after year, the results afford a measurement of the influence of the weather of each year which cannot be obtained under other conditions. I propose, therefore, on the present occasion to deviate from the usual form of table, and to give the produce on the selected experimental plots in 1894 and 1893, and for further comparison, the produce on the same plots in 1854, 1863, and 1864, which were the three years of greatest produce since the commencement of the experiments in 1844:—

Comparing first the produce of 1894 with that of 1893, it is seen that the unmanured plot gives very nearly twice as much grain in 1894 as in 1893; namely, 18 bushels per acre, against only 9½ bushels in 1893. The farmyard manure plot has given 45½ bushels this year, against only 34½ in 1893. It is worthy of remark that, contrary to what is usually the case, the farmyard manure crop was laid

	Unmanured Plot 3.	Farmyard manure Plot 2.	Artificial Manures.				Mean of Plots 3, 2, and 7, 8, 9 (or 16).
			Plot 7.	Plot 8.	Plot 9 (or 16.)	Mean.	
BUSHELS OF DRESSED GRAIN, PER ACRE.							
1894.....	18	45½	48½	49	47	48½	37¼*
1893.....	9½	34½	20½	21½	19½	20½	21½†
1854.....	21	41½	45½	48½	38½	44½	35½‡
1863.....	17½	44	53½	55½	55½	55	38½§
1864.....	16½	40	45½	49½	51	48½	35½||
WEIGHT PER BUSHEL OF DRESSED GRAIN, LBS.							
1894.....	60½	61½	62½	61½	61½	62	61½
1893.....	62½	63½	62½	62½	62½	62½	62½
1854.....	60½	62½	61½	61½	60½	61½	61½
1863.....	62½	63½	62½	62½	62½	62½	62½
1864.....	62	62½	63	63½	62½	63	62½
TOTAL STRAW, CHAFF, &C., PER ACRE, CWTs.							
1894.....	13½	50½	53½	64½	56½	58½	40½
1893.....	5½	20½	11½	13½	11½	12½	12½
1854.....	19½	39½	49½	54½	37	47½	35½
1863.....	14½	38½	52½	59	56½	55½	36½
1864.....	12	34½	44½	49½	53½	49½	32

- * Equal to 38 bushels at 60 lb. per bushel.
- † Equal to 22½ bushels at 60 lb. per bushel.
- ‡ Equal to 36½ bushels at 60 lb. per bushel.
- § Equal to 40½ bushels at 60 lb. per bushel.
- || Equal to 36½ bushels at 60 lb. per bushel.

earlier, and more completely, than that of any of the other plots. The farmyard manure gives, as a rule, more even produce, and is less influenced by good or bad seasons, than the artificial manures. This was especially noticeable in 1863, which was the year of the highest produce of grain yet obtained in the experimental field, and of the highest produce of straw, excepting that of the present year, 1894. In 1863 the farmyard manure plot gave 44 bushels, whilst the three artificial by manured plots gave respectively 53½, 55½, and 55½ bushels. In 1893 the same three artificially manured plots gave only 20½, 21½, and 19½ bushels, whilst this year they have given considerably more than twice as much, namely, 48½, 49, and 47 bushels.

RIGHT STAMP AND RIGHT MANAGEMENT.

The first paper on the list is that of my friend James Anderson, of Guelph, whose views largely coincide with my own upon many points, and especially one, namely, that success in swine breeding for profit depends not so much upon the breed as upon the "right stamp" of the breed and the right management or treatment after you have secured the right stamp. There are bad, good, better and best in all the breeds, and if we all would favor "the survival of the fittest" and act as we believe, that the "best is none too good," almost any of the breeds can be so improved by selection as to come near enough to the desired type for all practical and profitable purposes, without engaging in a war of extermination, though perhaps not without bloodshed. It is refreshing to find a man who has the courage to run a tilt at the conclusions of the professors at the Agricultural College, and Mr. Anderson takes issue with them on the question of raw versus cooked food for fattening hogs. This is a question upon which there is much difference of opinion, and it would be well if it could be definitely settled which is the more profitable. I think it safe to say that one experiment is not sufficient to settle such a question, especially when the experiment is conducted by different men, one of whom may not have shown as good judgment in the manner of feeding as the other, for it is well known that one man, with the same kind and quantity of food, may by judicious feeding, as to regularity and distribution, produce very much better results than another man with the same facilities, who lacks in these essentials of management. Much also depends upon the style of the pigs, their disposition to take on flesh and to make growth.

While I have never made any carefully conducted experiments to settle this question, I am free to say, from what experience I have had, that it seems to have settled itself in my mind that as a rule it is more profitable to give the food in a raw state. When

Swine.

ESSAYS ON SWINE BREEDING AND MANAGEMENT CRITICISED.

By Mr. J. C. Snell, before the Dominion Swine Breeders' Association, at Guelph.

When I was elected critic of the Essays on Swine Breeding and Management, in our report for 1893, I feared I had not been assigned a pleasant task, but I am glad to find so little room for adverse criticism, because I would at any time rather commend than complain. Yet, there are a few points in some of the papers, upon which there are honest differences of opinion amongst practical men, and I think it is well to refer to some of these, with a view to drawing out discussion upon them, and of possibly reaching a conclusion which may be generally satisfactory and safe; and here let me say that if I make no reference to some of the essays, it is not because I consider them unworthy of notice, but because they are so good as to be beyond criticism.

the extra labor and the value of fuel is taken into account, I am quite persuaded it will not pay to cook for pigs, and I am not sure that they will, as a rule, fatten more rapidly or make greater weight for the food consumed.

Mr. Anderson makes the statement that barley is a first-class feed for fattening hogs. This is a point that I think would bear some discussion, and as I have had very little experience in feeding barley, since I do not grow any, I would like to learn which is the best way of feeding barley. Of course, I take it that ground barley is meant, but whether it is best to feed it dry, or soaked in water, or freshly mixed with water or swill, is what I would like to have settled.

THE MANAGEMENT OF SOWS.

In the paper written by W. A. Cowle, Valens, Ont., on "The sow and her litter," the only statement I would criticise is that "the sow, at farrowing, should be from ten to twelve months old." I take it that the writer did not intend to convey the impression that this is the best age for the best results. My experience teaches me that older sows produce stronger litter, and as a rule make better nurses, and I think farmers as a rule are too ready to kill the old sow and try a younger one. As long as a sow is doing satisfactory work it is best to keep her at it, for the young ones are untried and consequently uncertain. I am persuaded that if the sow produces her first litter at from 15 to 18 months old, she will with the same treatment grow larger, and have laid the foundations of a stronger constitution. Certainly I think it safe to say they should not be bred to produce at a younger age than 12 months.

I have noticed in several of the papers in our report on the management of the sow and her litter at weaning time, it is recommended to wean a part of the litter first, say the stronger pigs, and the remainder in a few days later. I am not sure that this is the best practice, and would invite discussion on this point. I have never followed this rule, and have no experience of injurious results to the sow. For the comfort and safety of the sow, I think it is well to let her return to the pigs once or twice, say on the second and fourth day after separation, but my idea is that every pig has settled down to one teat, and that if a part of the litter is removed, the pigs remaining with the sow will only suck the teats they have been used to, and that the sow will continue to secrete milk in all her teats, possibly to the injury of those which are not relieved.

In the essay of Dr. Ormsby, on "The sow and how to treat her," I find this statement: "That while it is generally supposed that a sow will farrow almost on the exact day she is due I do not find it so. I find the time varies much with different sows, some running as much as ten days over the expected time." Now, while I do not doubt this for a moment, I will say that from my experience I have found that as a general rule a sow that has had the best treatment, that has had plenty of exercise and access to the earth or some substitute to this, such as ashes, charcoal and roots, will farrow almost on the exact day she is due, and when she goes from six to ten days over time. I have little hope of seeing a strong litter of pigs. I have known them to go ten and twelve days over time with spring litters, but almost invariably the pigs have been weak and flabby, and have lived

only from a few minutes to a few hours. I have never had a case of a fall litter coming more than four days late, and then never in the condition of helplessness that I have described in the case of spring litters that have gone over time, and I can only attribute the difference to the fact that in summer the sows have more natural conditions—that is, abundant exercise and free access to mother earth.

HANDLING YOUNG PIGS.

Mr. C. W. Neville and several other writers advise, at the time young pigs are born, taking them away from the sow, placing them in a box or basket, and returning them at intervals for nourishment. Now, I think that in very cold weather, or in a building where the temperature is too low for comfort and safety, and in special cases where the sow is very restless, this practice is all right; but I feel sure that, as a general rule, it is safer and better when the temperature and surroundings are all right to let nature have its course, and that the less meddling that is done the better it is for all concerned. If the sow has had proper treatment before she is due to farrow, having had exercise and such food as to keep her bowels regular and free, a quiet place, comfortably warm, and scanty litter of some short material, and protection from the sides of the pen, she will, in nine cases out of ten, attend to her own business better than any one can do it for her. Of course, there are exceptional cases, which require exceptional treatment, and it is well to be on the lookout and provide for the management of such cases.

A POINT IN WINTER FEEDING.

Mr. Sleightholm, in his excellent paper, brings out a point which I think is worthy of consideration and of commendation. In the treatment of all litters of pigs during the cold weather of winter, he says: "The feed should be fed dry, since wet feed loads the stomach with a cold mass, which is decidedly injurious." My own opinion is, that a great many pigs are ruined in winter by feeding large quantities of wet food, that is, a meal on shorts mixed with cold water. The pigs overload their stomachs with this cold mess, then lie in their beds and shiver. Nothing can be more likely to produce indigestion and derangement. I think that the troughs should be divided, so that in cold weather the dry food can be fed in one department and drink given in the other, so that the pigs can take it at their pleasure.

WHEN PIGS SHOULD BE FARROWED.

Mr. James Sharp, in his papers, says: "I look upon it as of very little account at what season of the year the pigs are farrowed, if one has a warm pen." My own opinion is, that there are just two seasons at which it is most profitable to have the pigs farrowed—that is in early spring and early autumn. Pigs born in March or April can soon be let out upon the ground in fine days for exercise and the variety of condiments which instinct teaches them to look for, for even a little pig "wants the earth," and may be fattened for the late summer and early fall market, and, if kept for breeding purposes, will be a good age in November and December—the boars for service and the sows for being bred to farrow when a year old. Fall pigs for best results should be born in September and early in October, when they can have abundant

exercise on the ground to strengthen and develop bone and constitution to stand the close confinement necessarily incident to fattening pigs in winter. Pigs which are born in the late fall and winter months are liable to get stunted, even in very warm pens, or to go off their legs largely from want of exercise; and if they do not get stunted, it is reasonable to say they cannot have the necessary exercise to develop bone and muscle to the best degree, which is very essential in the case of those which are to be kept for breeding purposes. September and October pigs, again, are of good age in April and May to breed for early fall litters, or to market for pork in the early summer months, when, as a rule, prices are higher than at any other season of the year.

Household-Matters.

If you have not already got it, now is the time to agitate till you get that dear little green patch of recreation ground for the use of the household. What matter if there could be a few bushels of potatoes grown on it, the loss of that is very small in comparison with the health of the family. Cabbages and turnips are useful and good in their way, but surely there is plenty of room on the farm to spare a nice bit of ground near the house for the beautiful as well as the useful.

There ought to be, near every house, flowers to please the eye, and a good bit of grass where the children can have a free romp, and still be under the eye of the busy mother in the house, and with what a thankful heart she will join them, with her sewing, and be able to enjoy the fresh air till duty calls her in doors to resume with brightened feelings her many duties.

Where land is so plentiful, every house ought to have its play-ground and the children be encouraged to play leap-frog or any other game rather than sit moping on the steps as they are so fond of doing.

Cultivate a few flowers when an occasional peep can be got of them from the house. They will gladden the eye and make the work seem lighter, for the mind looking on the flowers will be apt to ignore for the moment the meaner, necessary work of the hands.

Hashing meat.—A hash is a very delicious dish if well made. The way we have made it for years is very simple and good if the mode is strictly carried out. Cut the meat from the cold joint in thin slices, lay them on a dish and slightly pepper and salt the whole and sprinkle it over with flour, continue to cut up and prepare the rest in the same way, and put it away till wanted.

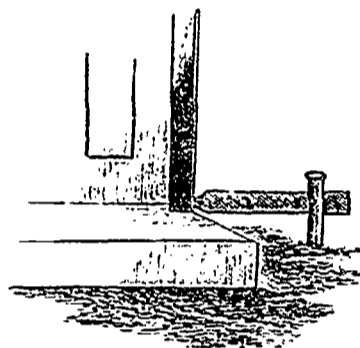
Smash up the bone and put on to boil with an onion, parsley, celery and a very little of any seasoning liked, cover the whole with water, and boil well to get out the flavour and reduce the stock to the quantity wanted. Custom will soon show you how much is wanted but let it be good not watery. About 15 minutes before dinner time strain, and after making the stock hot begin to put in the meat not too much at a time keep moving it about, and watch that it never boils for herein lies the secret of making a good or bad hash and also of having it hot. Make toast and cut into triangular pieces to garnish the dish with and also to be eaten with the meat.

Meat that has been long boiled during the process can easily be detected, as the slices curl up and are often hard. The flour sprinkled over the meat will make the thickening and if carefully done these ought to be no lumps.

Browning for hash.—Put into a frying-pan, a cup of sugar and a small bit of butter, just moisten the sugar, and stir about till you get it a nice dark brown, without burning, now add a little water at a time till you have about a pint of liquid more or less: bottle this and keep for colouring hashes, or stews.

Put in as much as will make the gravy look a nice pale brown.

Helpful to the Housewife.—An old flat file, although an apparently useless thing, can be made very helpful to the housewife by driving it into a post beside the door and sinking it in a stake driven into the ground at right angles. The combination forms an indispensable foot scraper and labor saver, which can be made by anybody



INDISPENSABLE FOOT SCRAPER

in two minutes, according to the Farm Journal. If the end of the file projects an inch or two, it will be very useful to scrape the boot between the sole and upper. An old broom standing beside the door will complete the outfit.

F. and Home.

Bread Board.—The top of a candy pail, which any grocer will give away, makes an excellent board to cut bread on. Hang it up with a ring head screw in the edge.—[E. R.]

Domestic.—To Remove Mildew.—(Reply to F. J. C.)—Take the clothes when dry and wet thoroughly with soft soap and salt mixed. Lay out to bleach on the grass. If any trace of mildew remains, use the second time, and the linen will be as clear as over.

To disinfect clothes—About the house.—Try the hospital recipe for boiling clothes: To every two pails of water for boiling add a teaspoonful of kerosene, and to the whole boiler a half bar of soap, scraped and melted in hot water. Put in the clothes, and note the time when the boiling begins. Let them boil about seven minutes, and then remove, preparing a new boiler full of water for the next lot of clothes. Let each lot as it comes out be put into a tub with fresh warm water to soak out the kerosene.

Women should learn that veils figured with sprigs or anything but unobstructive dots are never becoming and make the face underneath look like—well, as if the owner was wanting in taste and judgment.

N. W. F.

Nursery Notes.—A five cent medicine dropper and vaseline will reduce to a minimum the misery of clearing

a child's nostrils. A straight one is necessary. Stick into the vaseline two or three times with the bulb expanded, then insert the point and pinch the bulb quickly. In a few minutes there will be no more trouble, as the natural tendency is to clear themselves. This is especially comfortable for little babies.

A pair of small steel tweezers (very inexpensive) should be in a generally known place in every house, particularly where there are children.

It always makes the dreaded splinter or brier in the bare foot much more easily managed and often saves a doctor and much misery as in case of a needle.

Dipping the soles of the feet in cold water—even wetting to the knees—and rubbing well, is a great nerve tonic. Some physicians say "the best tonic known," and it is very helpful where children are wakeful in the night or predisposed to colds.

One egg is a great plenty for a child under five years. They are much more digestible before being cooked: i. e. scrambled with a little cream or in omelette; or better still beaten into a little boiling milk and removed at once.—C. Gentleman.

Make the Drinking Water Safe.—

Tea is one of the best things in the world to put in drinking water to improve its taste and to counteract the effect of change in water which affects so many people seriously. Take a quarter of a pound of black tea and pour over it nearly a quart of boiling water. After letting it stand for two hours, pour off the liquid into a bottle with a glass stopper and carry it in your traveling bag. If you want iced tea all you have to do is to put three tablespoonfuls of this decoction in a glass, add ice water from the cooler and you have a pure and healthy drink. They say that the reason the Chinese drink so much tea is because the water in that country is such awful stuff.

System in the Store-Room.—Carrie May Ashton.—Some housekeepers keep a supply board on which is a list of the groceries which are usually kept in store; opposite to each name is a small hole with a long wooden peg to fit it. The girl who takes charge of the store-room puts a peg in the hole opposite to all groceries that are nearly gone, so the housekeeper, who does the marketing, can easily see what is needed.

A memorandum book should hang in the store-room and the quantity and date of buying should be kept.

Where there is no store-room, a want-book or slate should hang in the kitchen and the cook be instructed to write down every morning the names of groceries that are needed.

A store-room should be light and cool and well aired.

F. and Home.

Cleaning out wells.—Now and then a farmer who has been using his well for 10 or more years, takes off the covering, provided that the rotting logs that cover it have not given way, and dropped some man or beast into it. Few people realize till too late the danger that lurks in a well. A few feet in the bottom next the water, are filled with carbonic acid gas or choke damp, and it is not rare to read of one or two men being choked in a well through pure want of thought. Farm and Home tells this story: "The well was to be cleansed, but the

man who took the job was afraid to go down until he had ascertained the quality of the air at the bottom. He let down a lighted candle, and when it descended within about 6 feet off the bottom it went out as suddenly as though extinguished by a whiff of air. That was all he wanted to know. He was then sure the well had poisonous gas in it, and took a small umbrella, tied a string to the handle, and lowered it open into the well. Having let it go nearly to the bottom, he drew it up, carried it a few feet from the well and upset it. He repeated this operation 20 or 30 times with all the bystanders laughing at him; then again lowered the light, which burned clear and bright even at the bottom. He then condescended to explain that the gas in the well was carbonic acid gas, which is heavier than air, and therefore could be brought in an umbrella just as though it were so much water. It was a simple trick, though perfectly effective." N. W. F.

two carefully, so as to get the points to correspond, then turn over and trim round the edge with cream lace, take the greatest care in fitting the lace well round the points so as to fall nicely without dragging, gather very little indeed, and make the neck band which must be a little stiff. Line nicely, with something strong and soft enough not to irritate the skin.

Turn up the lining on the outside and sew on the large frill. Now finish the neck with folds of the pink and make a gathering of the same double on each side of the neck, on one side under the frill must be the fastening, and two points of the large frill must fasten in the same way.

The waist is made of woollen *crêpon* and I have seldom seen a prettier combination of colours.

Oranges and dypsomaniacs.—The new new virtue claimed for the orange—that if consumed systematically it

New Lamps for Old.—The bronze lamps so much in vogue a few years ago, which by this time have assumed a discolored and fly specked appearance, can be renovated by the application of enamel. Have the article scrubbed as clean as soap and water will make it, and give three coats of cream enamel, allowing each coat to dry thoroughly before applying the next. They will look like ivory or creamy china, and may be picked out with gilt if so desired. The same may be done with brass lamps, or at least the imitation brass which tarnishes so quickly. The imitation silver frames and toilet ornaments, after they become tarnished, may be renovated with enamel, which may be changed from cream to blue or pink after a season's wear. For beautifying old picture frames, enamel is positively invaluable in the hands of a person with some artistic taste. E. C.

Pounded Glass, mixed with dry corn meal and placed within the reach of rats, it is said will banish them from the premises; or sprinkle cayenne pepper in their holes. (1)

Sour Sponge.—By rubbing a fresh lemon thoroughly into a soured sponge and rinsing it several times in lukewarm water, the sponge will become as sweet as when new.

Seasonable Selections.—A few things to avoid.—Never call upon people just at bedtime, or during dinner, or before they are downstairs in the morning.

Never stop people who are hurrying along the street and detain them for ten or twenty minutes.

Never, when you see two people engaged in earnest talk, step in and enter upon a miscellaneous conversation.

Never begin to talk about "this, that and everything," to one who is trying to read the morning paper, or a book or anything else.

Never fail to keep an appointment.

Never inconvenience people by coming in late at church, theatre, lecture or concert.

Never delay in answering letters or returning books.

Never tell long stories of which you yourself are the hero.

Never speak disrespectfully of your parents or of your sisters. People may laugh at your wit, but they will despise you for it.

Never talk when others are singing or doing anything else for your amusement, and never, the instant they are finished, begin to talk upon a different topic.

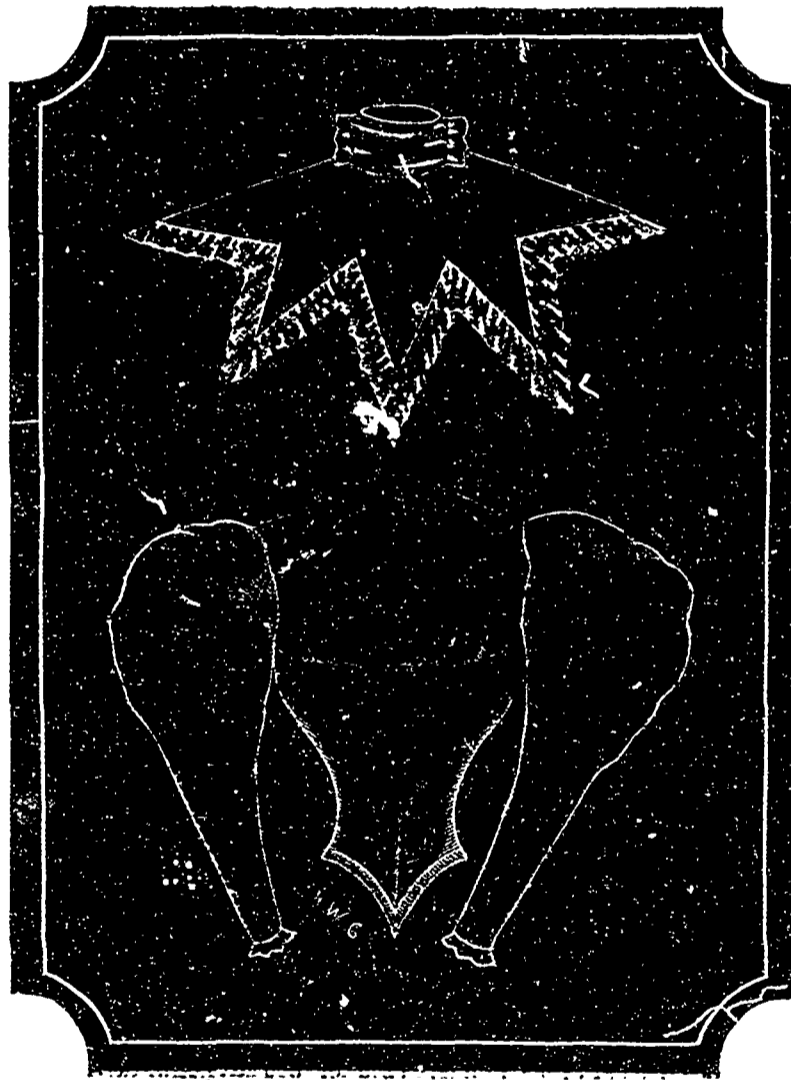
Vt. F. Advocate.

METEOROLOGY.

A Lecture, by Arthur R. Jenner Fust.

'Science!' I think I hear some honest old fellow exclaim: "In my time we heard nothing about such nonsense as that. It was enough for us to know how to plow and sow. It did not want much science to teach us how to do that." Perfectly true. Not much science was wanting, either, to teach you how to exhaust your land; but a little science would not be amiss if it would teach you how to restore your land to its pristine fertility. In hay-

(1) But nothing is like a couple of ferrets and a brace of terriers trained to "stand there."—Ed.



I asked my little friend K. W. G. who kindly does the illustrations for me, to sketch a waist I have admired for the last three months, and here it is. It is made in pale green and pink *crêpon*. The waist is quite plain in the back, but the front outside is slightly full on the lining, and where the dotted lines run there are three pleats carefully brought in to fit the figure.

The lining is fastened down the front and must be well done not to gape open and show.

The bottom of the waist is finished as usual, this one has a little of the pink about half of an inch just round the edge slightly full.

The sleeves must not be too large as they would be in the way of the collar.

Last comes the collar which is made in pink silk *crêpon*, and great care must be taken to get a good fit. Cut out outsides and lining and join inside the

will wean the veriest sot from all alcoholic potations—is being widely discussed in England. Six oranges per diem form the ration, to be consumed at interval of two or three hours. In answer to the inquiry propounded in daily newspapers: "What must a man do if he can't get oranges?" a correspondent says: "Let him take apples. Apples, even more than oranges, have the power to diminish, and if eaten systematically, to entirely eradicate the craving for stimulants. This is owing to the malic acid which completely renovates and purifies the whole system. If fruit were freely taken as a part of the daily meals we should hear far less of the troubles and ailments now so common. It may not be generally known that oranges are also specially valuable in lung complaints, the acid citrate of potash preventing the development of pneumonia."

V. F. Advocate.

time and harvest, your crops, after all your labour, are dependent on the weather. Would any help from science, which should teach you to foretell the probable weather 24 hours in advance, be a thing to despise? Two ploughs are offered you for sale—equally showy in appearance—would science be useless, if by means of the dynamometer she showed you which of the two would give your horses the less work? Two samples of manure—guano, superphosphate, or what not, are forwarded to you for choice: science can tell you the comparative value of each: will you spurn her aid? What is this science after all but a Latin word equivalent to our old English word *knowledge*. I don't know any modern trade that can get on without it. The builder can't, he may never have heard of the *parallelogram of forces*; but he must know all about levers, pumps, screws, and arches. The miller can't, he would not be able to adjust the diameter of his wheel to the cubic contents of the bed of his stream without it. The tanner does not refuse the aid of science in hastening the preparation of his leather, or in cheapening the materials used in his pits, and the dyes of the cloth manufacturer would be but strangely blended, were it not for the mordants which his chemist enjoins him to use.

Some time ago, a foundry-proprietor, weary of paying out money for coals, determined to utilize a fine water-power which lay about 2 miles from his establishment for the purpose of working his fan or blast. The pipes were laid, and the fan went to its duty with great energy—no effect though in the cupola! How so? There must be a hole through which the air escapes—pipes were taken up and cased in tarred cloth: still all the sound in the cupola was as of an asthmatic old man wheezing away at a tobacco-pipe that would not draw. At last, science was consulted, and replied, in effect, that the foundry-proprietor might have saved all his outlay had he consulted her at first: the friction against the sides of the pipes had devoured all the power of the blast.

The days are coming when, in these old cultivated lands, we shall have but a choice of two things: either to let the soil revert to its former state of bush, or to restore its fertility by means of artificial manures and stock feeding. If we prefer the former—well, we must depend on others for our food, and become a purely manufacturing community. If the latter, without we know something of science, we shall be robbed with impunity on all sides.

Now, science is to many a word of vague meaning and vastly terrific sound. It must not be allowed to frighten you, though. The more you know of science in general the better you will understand its principles. I mean its foundations, you need not be an engineer or an analytical chemist to be very usefully fitted for your agricultural career. A few weeks' earnest application for 3 or 4 hours a day would give you such an insight into the practical working of those branches of science that concern you, that you would feel yourselves in a position to detect a fraud whenever you meet with it—and that, at all events, is more than 99 farmers out of 100 can do now. Of all impossible lies that are told in the world, commend me to those told by certain men who have trees, implements, or manures to sell. If you can learn, by a little study, how to avoid being robbed by

those scoundrels, you will not have wasted your time.

I shall now proceed to consider that branch of science with which perhaps we have most concern—*Pneumatics*, we could not breathe without *pneuma*—the breath—but with us it has a wider signification. *Pneumatics* treats of the air, and the laws which govern its condensation, rarefaction, and gravity. The body of air surrounding the entire surface of our globe is supposed to be about 57 miles high. You can form no more idea of this than you can of what 200 million dollars are; but conceive a ball one foot in diameter having been left untouched in your drawing room, by a careless housemaid, until it has accumulated a coating of dust one-tenth of an inch in thickness: that is about, the relative proportion of the earth and the circumambient air.

Air has weight (gravity is just the same thing; the force of gravity is the force of weight): 100 cubic inches of air at 60° F. and with the Barometer at 30 inches, will weigh about 30 grains. So you see it has a considerable power of pressure—if taken at 50 miles high and at the above weight the force would be 15 lb. per square inch. This, in mechanics, is said to be one *atmosphere*—as you may see on the *steam gauge* of any engine: 5½ quatrillions of tons, or a ball of lead 60 miles in diameter, represents the total weight. Powerful stuff enough when bought wholesale isn't it, though it is such a thin, almost imperceptible concern, as we walk through it? If it is so heavy, why does it not, all round and above us as it is, crush us to death? A man of ordinary size contains on his surface about 2000 squares inches—the air presses upon him with a force of 2000 × 15 = 30,000 lbs. and yet he is not powdered! Fortunately, in obedience to the laws of equal and contrary pressure of the air *without* and *within* the body, the catastrophe is prevented. And of what is this wondrous atmosphere composed?

It contains in every 10⁰ parts:

	by measure.	by weight.
Nitrogen.....	77.5	75.55
Oxygen.....	21	23.32
Carbonic Acid.	0.08	0.10
Water in vapour	1.42	1.03
	100	100 (1)

Observe how the carb. ac. is proportionately heavier than bulky—how watery vapour *distends* the air.

There is no chemical combination here, merely mechanical mixture. Add the two papers of an ordinary Sodlitz powder to a glass of water, and you have chemical combination—Stir up a spoonful of sugar with a spoonful of mustard, and you have mechanical mixture.

Here we are at a standstill, for we don't know anything about N., O., or C., but let us say for the present that N., often called *Azote*, or *life depriving*, as no animal can live in it, has to be thinned by O₂ or *acid generator*, to make our air breathable—as in N. death comes from impossibility of breathing, so in O death ensues from rapidity of living: in N. a candle won't burn, in O. it burns out like fury.

These proportions in the air never vary. Animals and vegetables use the air in all places, and in using it *change* the proportions, but the sun's heat in the tropics, and their luxurious vege-

(1) I say nothing about the newly discovered element *Argon* (1895), because it is, as yet, unknown to the crowd.

tation, evolve an abundant supply of oxygen, while, perhaps, the predominant existence of animals in the colder regions affords plenty of carbonic acid—this however is not certain, but at all events, whatever the source, the beneficent winds of heaven mix all the constituents of the air together, and make them fit for our inhalation.

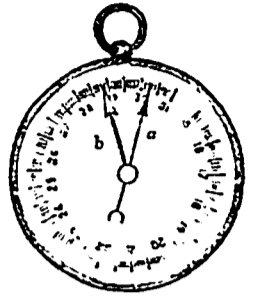
There ought to be in every farmhouse in the country an instrument to measure the gravity of the atmosphere—the *Barometer*—I should recommend a well made *aneroid* as the more sensitive, tho' the upright mercurial barometer is, if large enough in the tube to overcome or lessen the friction, correct enough for all practical purposes.

Now, this instrument is founded upon a very simple theory: the column of mercury is 30 inches high, and of exactly the same weight as a column of air of the same diameter, 50 miles high, and of a column of water of the same diameter, 33 feet high. So that, as you may observe, the air pressing on the open end of the tube keeps the column of mercury in equilibrium. Let, however, the air become drier or more moist, and a change takes place. In the first case the Barometer rises, in the second it falls. How is this? Is dry air heavier than moist air? I answer the question by another—is a bushel of dry sand heavier or lighter than a bushel of wet sand—a bushel of dry wheat than a bushel of wet wheat? What did we find in the air besides Nitrogen, Oxygen, and Carbonic acid? A little vapour, which by weight formed 103 of the 100 parts; but in bulk 1.42. Moisture, then, from its excessive tenacity in the vaporous form we find it taking in the atmosphere, causes the air to occupy more space, so to speak, and therefore to become lighter—but, in dry weather, the air becomes dense, from the highly elastic vapours, and presses with increased force upon the exposed mercury. I may as well mention here that, in the *common pump* the same principle is called into play. The plunger, in rising when the handle is depressed, withdraws the air from the chamber of the pump; and the column of air pressing on the water of the well or tank, causes it to rise, and fills the chamber which has been exhausted of air. Theoretically, 33 ft. 9 in. is the limit of the action, but practically, pumps won't lift above 28 or 29 ft. The force-pump acts by both the elasticity and the pressure of the air. The ordinary force of the column of air raises the water to the 30 ft., or so, and the elastic force of the air in the condenser sends it thence 200 or 300 feet onwards: as in your fire-engines.

The *Siphon* is also dependent on the same principle. Here we have a bent tube with two unequal limbs, the greater the difference between the length of the limbs the more efficient the instrument. But to return to our Barometers, there is another form of these "weather glasses" as they are sometimes called, the *aneroid* from a *neros*, without moisture (1). This handy, elegant little instrument is the most portable of all barometers, and, if

(1) The *aneroid barometer* is an invention by M. A. de la Roche, of Paris. Its action depends upon the effect produced by the pressure of the atmosphere on a metallic box, from which the air has been exhausted: the box is then hermetically sealed. As the weight of the atmosphere increases or diminishes, the surface of the corrugated elastic box is depressed or elevated, as is also at the same time the spiral spring upon which the principal lever rests; and this motion is communicated through the levers to the *arbour* of the hand. The tension of the box in its construction is equal to 4½ lbs.

carefully constructed, the most correct; but it should, now and then, be compared with a mercurial barometer and, if in error, corrected. Take care in buying an ordinary barometer to see that the column is large enough: if small, the mercury won't work freely, it will stick to the sides of the tube.



Aneroid Barometer.

We may as well take the Thermometer into consideration at once, and then we shall be free to attack with these weapons our great and interesting object *Meteorology*.

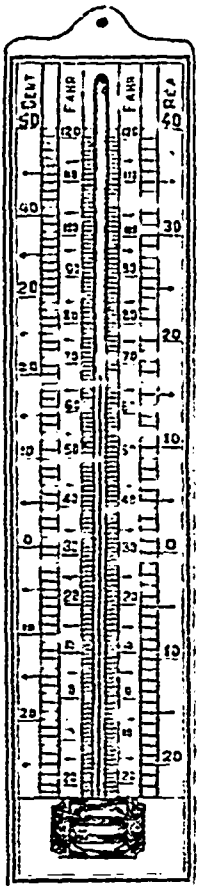
You all know what heat is, or rather what it does. A pint-pot will hold a pint of cold water—but by no means can you keep the liquid in the measure when it is nearly boiling; heat then expands objects: cold on the other hand, contracts them. Heat is the great opponent of gravity. If gravity acted alone, everything would be a dense solid; there could be no life. The property of heat is to part asunder the atoms of all bodies. It is invisible, and imponderable. I must harass you with a difficult phrase; "latent heat"; all bodies contain this quality or whatever you like to call it, it lies hid in them, and is brought into notice by friction. Rub two pieces of wood together and what happens? heat is evolved: whence did it come? it was there in the wood, and the friction drew this latent heat to the surface. Why? Because motion always is accompanied by heat, a law of nature, and the intensity of heat is always in a specific relation to the velocity of motion. You see then that no instrument can measure this latent heat: what does that which we call a *heat measurer* do? All that we require of it: it indicates the *relative* amount of heat in various bodies, or in the same bodies under different circumstances.

You are all familiar enough with the ordinary Thermometer. A simple glass tube, air exhausted, hermetically sealed. Three sorts are in use—Réaumur's, the Centigrade or Celsius, and Fahrenheit's.

Now, the principle on which these are constructed is the same in each. It is only in their notation that they differ. Réaumur, a Frenchman, (1683) was the first to propose the use of mercury as the expansive medium in the thermometer. Alcohol had been used, but its expansion proved to be irregular. He took the melting point of ice as his zero, and each of the divisions he made equal to 1/80 part of the bulb capacity. Fahrenheit, a Dane (1686 to 1736), ingeniously fixed on another standard point—that of boiling water under the mean pressure of the atmosphere; in his scale 212°. He called the melting point of ice 32°, and fixed his zero at what he, erroneously, supposed to be the greatest cold, viz. a mixture of salt and snow. Celsius, a Swede, (1670 to 1756), starting from the same point as Réaumur, divided his scale into 100 parts; hence the name given to it:

The conversion of these notations is easy enough:

Multiply the degrees of Réaumur, by $\frac{9}{4}$, or $\frac{3}{2}$, and add 32° ; you have Fahrenheit—for example, suppose we have 20° of Réaumur, then $\frac{9}{4} \times 20 = 45$, to which add 32° and you see at once that 20° R. equal 77° F. Again, to convert Celsius, or centigrade, into Fahrenheit, multiply by $\frac{9}{5}$ and add 32° . Thus, if we have 20° of centigrade:



Cent., Fahrenheit, Réaumur.

$$\frac{9}{5} \times 20 = \frac{180}{5} = 36 + 32 = 68^\circ \text{ F.}$$

And again $\frac{4}{9} \times \text{Celsius} = \text{Réaumur}$; and $\frac{5}{9} \times \text{Réaumur} = \text{Celsius}$. Of course, to reverse matters is easy enough—divide, after deducting 32° , instead of multiplying: what degree of Réaumur is equal to 77° of Fahrenheit?

$$77 - 32 = 45 \div \frac{9}{5} = \frac{45 \times 5}{9} = 25.$$

Do not buy cheap thermometers, many of them vary even as many as 5 or 6 degrees, and are useless, even for dairy-work.

Lastly, we have the Hygrometer, or *moisture-measurer*. There is a simple one, not unlike the Aneroid in shape, with a pointer composed of two pieces of wood so glued together that as the humidity increases it twists through the degrees to the right, and as the air dries twists back again. It is useless alone, but combined, as it ought always to be, with the Barometer and Thermometer; with the appearances of the clouds, sun, moon, behaviour of animals, etc.; a very shrewd guess may be made, by a persistent observer, as to the probable weather for the next 24 hours.

In judging of the prospects by these instruments we must observe that the Barometer being constant is the surest test: if it remains low, or if it remains high, the weather will be fixed—if it jumps about the weather will vary.

The words, *dry*, *set fair*, &c., on some old barometers are nonsense, if the mercury is convex at the top, the whole is rising; expect fair weather; the middle rises the most easily on account of the friction of the sides against the tube. If the mercury be concave, the whole is falling, and a change of weather is at hand. A sudden fall of an inch or so indicates a storm within 24 hours.



Mercurial Barometer.

At St. Thomas' island before the hurricane of 1807, it sank $3\frac{1}{2}$ in. in as many hours.

If some fair morning in early summer, with a tranquil feeling of content about you, you approach your barometer and find it at 30; tap it; if it rises convexly, if the thermometer in the shade is at 75° F., and the hygrometer at 40° , you may go about any work you please without fear of interruption from the weather. Mind, in observing the indications of either of these instruments, to bring your eye to the level of the mercury; otherwise you will fall into many an error: the observations of a 6 foot or a 5 foot man would never agree.

You will now be able to understand how the barometer is used for measuring the height of mountains. You saw that the column of air, 50 miles or whatever it is, high, exactly balanced the 30 inch column of Mercury in the barometer. In ascending a mountain one mile, it is clear that $\frac{1}{30}$ part of the weight of the pressure is taken away; therefore, allowing for the temperature, $\frac{1}{30}$ part must be deducted from the sum of pressure. I say, allowing for the temperature, because heat causes the mercury to expand, by evaporating the moisture in the air; and cold contracts it by checking evaporation, and thereby increasing the density of the air. Two observers are requisite, one below the other, and both must have thermometers as well as barometers. (1)

The following may be taken as pretty correct indications of the weather by the barometer:

Rise: Fair weather.

Fall: Foul.

In sultry weather, a fall indicates thunder, and the thermometer generally falls, too, before the storm comes up.

If in winter, spring and autumn, the mercury rises, there will be cold weather.

Heat, on the other hand, is indicated by a fall in summer and autumn; but frost, by a rise in winter.

If in a frost the mercury falls, a thaw will follow.

When at any season, a continuous fall happens through several fine days, continued bad weather will be the result. And the reverse.

When fine weather sets in suddenly, it will be of short duration.

A sudden extreme change denotes changeable weather.

If the temperature remains constant, a rapid rise or fall denotes wind.

A rising glass with cooler air, indicates fair weather—rising glass with warmer air—changeable.

Wind is air in motion. If you overlived under the shadow of the Laurentian mountains, you have remarked that the direction of the wind changes every 24 hours during the summer months: this change is most distinctly perceptible in a heated term. From the hills all day, and towards them in the evening; just as on the coast in hot climates, the land and sea breezes alternately heat and refresh the inhabitants.

Why does the flame of a fire just lighted ascend the chimney? For the simple reason, that being rarefied, or made thinner, lighter, it naturally seeks the highest place. The air rushes after it and you can feel the draught. Just so is it with the winds. It is all a struggle: air heated, and therefore rising, cool air violently anxious to occupy its place. The

(1) Not strictly correct, as of course, the lower part of the atmosphere is the heavier; "but it will serve," as Mercutio says, in Romeo and Juliet.

sun's heat raises the temperature of the earth in the tropics, which affects the density of the atmosphere; the air ascends, and is replaced by two cold currents from either Pole, the trade winds. Observe particularly this point—heated air rises, and is followed by fresh currents of cold air. If you feel this once you will never, as many people do, make a bungle of your stable, and other, ventilation. If you want the foul heated air to escape above, you must let in the nice cool air below. A draught of some sort there must be, only keep it away from your animals' heads. This by the way; as is also the fact that a West Indian Ouragan (Caribbean, not French) has blown cannon out of the batteries!

We will now turn to some of the natural phenomena, most interesting to all, but especially to you farmers; phenomena which coupled with an accurate and regular daily notation of your instruments will make you safe prophets as to the diurnal changes of the weather. But I forgot, as I am sorry to say, I often do—I must first say a word about clouds.

A cloud is a body of vapour—often of enormous size. There is, as we saw, about $\frac{1}{8}$ of the whole bulk of the air vapour. When from any cause the temperature of the air is reduced, the atoms of vapour approach each other, coalesce; and, as the steam from a kettle is visible in the kitchen, vapour becomes visible when condensed by cold, and takes the form of a cloud. Their height varies from 1,300 to 27,000 feet above the sea. Layer after layer of clouds may be seen on ascending mountains; and they may be often observed moving in opposite directions at the same time. No better presagers of weather than clouds. They look as if, in form, they were innumerable, but they may be reduced to three sorts: Cirrus, Cumulus, Stratus,—multiples of these are: Cirro-cumulus, Cirro-stratus, Cumulo-cirro-stratus, the storm cloud.

The Cirrus or curl-cloud—the least dense of all. Streaks of white vapour, in fibrous forms, for instance; the *gray mare's tail*: supposed to be of snow, as Glaisher, in a balloon, went up 7 miles,—nearly losing his life thereby—and then the cirri were apparently as high as they seemed from the earth. Say they are 14 miles; the temperature at that elevation must be far below zero of F's scale. The cirrus of rod-shape with fibres is the highest; the upturned-end-rod next; the one like a bunch of feathers is approaching the earth; and the sheet-like form is not much above the denser clouds.

If, in a clear, dry, settled-looking sky, cirri appear, there will be a change: all signs of change show themselves first in the upper regions of the air. When *mare's tails* appear, there will be wind within 24 hours from the quarter to which the tufted head points. If during rain, you can see cirri through a broken cloud, in a deep blue sky, the rain will continue. Noah's Ark, a cirrus extending from horizon to horizon across the Zenith, indicates rain within 12 hours—when it does not reach our Zenith, rain will fall only on those places over whose Zenith the Ark is. If the cirrus and cumulus unite, and pass over the Zenith rapidly, rain in 12 hours. In fact accurate observation of the cirri will be an almost sure guide to the weather, and when joined to the indications of the barometer and thermometer, a perfectly sure guide.

Cumulus, or heaped cloud, when like a rough hay-cock, ragged at the ends, indicates rain; but smooth and regularly formed, portends fine weather.

If cumuli remain till evening, and increase in size, rain. If they form in the morning, and towards night disappear, fine weather.

Stratus is that bed of vapour which you may often see settle down into valleys and hollows in fine summer evenings. Most picturesque, most poetical of clouds. Spires and towers stand out above it in bold relief. If the rising sun disperses it, the day will be fine; but when it lifts, and *lingers long on the hill-tops*, there will be rain p. m.; particularly if it creeps down again towards the low lands.

When the cirrus, losing its fibrosity, forms little heaped clouds, they are generally high in the air, and in summer foretell heat. If gray ones appear in the morning, heat; if red, rain. When cirri become compact, and heavy looking, a thunder-storm will take place in 24 hours.

Cirro-stratus clouds sometimes appear stretched out along a hill-side, cutting off, apparently, the mountain top; sometimes they run across the field of the setting sun, and afford that glorious sight of gold and vermilion bands on their upper and lower edges. These are the clouds that produce haloes or coronæ.

Cumulo-stratus is always dense. Cloud mountains spring from the long stratus, and the upper part is often mixed up with cirri.

Cirro-cumulo-stratus, a combination of all the forms of clouds, is that heavy menacing cloud we see when thunder-storms are approaching. It is too well known, and its sequel when observed too certain, to need description.

The following is a short list of cloud-prognostics.

They are not always sure, but almost always.

If clouds cling to the hill-tops, or unite with each other, rain.

If they form and vanish soon, fair weather.

Ragged edges denote rain—very ragged, wind.

If the edges are distinct, clear cut, fine weather; if rolled up, thunder.

If the edges are indistinct, muddled, rain—bad weather, at all events.

High Barometer, Thermometer, and Hygrometer—little cumuli all day, vanishing towards night—stratus disappearing after sunrise, and heavy dews: fine, settled fine weather.

But winds and clouds are not the only foretellers of weather. They are about the most certain, but there are many others.

Did you ever see a cat scratching the leg of a table? Wind is sure to follow. So with cattle, when they jump about and butt at each other: when sheep leap and play. When pigs squeal, twist their tails, and carry straw about in their mouths: wind and rain. What does Mr. Swifoller say? "It is very fine; but last week was a pleasant one for the ducks. To day, however, I noticed a pig issuing from a tobaccoist's shop with a straw in his mouth; from which, I argue that another fine week for the ducks is at hand!" (1) When geese and pigeons flap their wings much; when crows tumble about and chatter in their flight, wind is sure to follow.

Distrust the weather when you hear the Robin sing loudly in the evening—he is not a Robin, but a Thrush, and his German brother is called the Sturm-Cock.

When distant objects appear unnaturally near—when you hear the rat!

(1) Dickens' Old Curiosity Shop.

of a train which you don't generally hear—rain.

When flowers smell unusually sweet, because the air being moist carries their odour more effectively.—When swallows fly low, because the insects they hunt fly low to escape the moisture of the upper regions of the air.—When ducks and geese go to the pond or river and dash the water over their backs, because by wetting the outer coat of feathers they prevent the drops of rain from penetrating to their bodies through the dry and open feathers.—When horses and cattle (not bulls or rams) stretch out their necks, and snuff up the air laden with the fragrant perfume which increasing moisture diffuses through it.—And when all domestic animals are restless and excited: rain, rain, rain.

Spiders are, as you have doubtless remarked, crafty, as well as blood-thirsty, beasts. When they spin away merrily at their webs, fine weather; for they know flies will take their walks, or rather flights, abroad. But rain, when they hide in their holes.

Gnats, Mosquitoes, Midges, all know when it is safe for them to show themselves. You will hear the owl shouting away jollily before fine weather in his (supposed) melancholy hole—out of opposition I presume to the Robin, whom he eats sometimes, and who, as we heard just now, sings before foul weather. By the bye, there is a superstition still extant in Devonshire (one of the last hiding-places of witchcraft), of old women turning to hares. Many years ago, being caught by a heavy shower in the West of England, I turned into a gamekeeper's cottage for shelter. Here, I was very much struck by a glass case, containing a stuffed hare many degrees darker than hares generally are.—“What is that?” said I to the keeper; “Oh! Sir,” replied he, very sedately; “that is old Mrs. Wilson. I shot her one morning last summer about ½ past 3 o'clock, as I was coming home from my rounds; at 10 o'clock, the neighbours, seeing that her window-shutters were still closed, went to find out the reason; and the old woman was there lying dead in her bed, with the marks of the shot, saving your presence, all over her back—she'll bewitch no more poor men's cattle though, anyhow!”

And the man believed that he had done the world good service in ridding it of an enemy and a bond-slave of Satan.

But to return to our owls: the creed is, that their hooting portends a death: they scream, sure enough, when a change of weather is at hand, and sick people on their death-bed may be hurried towards the last gasp by the atmospheric alteration, because the flickering lamp of life has not strength enough to adapt itself to the change.

Watch well your bees—you all, of course, have apiaries; they cost little, except care, and 50 or 60 hives are worth looking after. Watch, I say, your bees—when they wander far from home it is because they instinctively feel there is no danger of their being overtaken by rain. What says Virgil?

“Sunt, quibus ad portas cecidit custodia [sorti, Inque vicem speculantur aquas et nubila [caeli. Nec vero a stabulis pluvia impendunt [recedunt Longius, aut credunt cœlo adventantibus [Saris.”

“Some have the guardianship of the doors allotted to them, and, by turns, examine the signs of the weather. They never wander far from the hives if a shower is imminent, and stay at

home when the wind threatens to be boisterous.”

Those unpleasant excrescences on feet, again; and I fancy, since those very fascinating high-heeled boots came into fashion with the sex, they at least need no barometers: corns, as they are called, from cornu, a horn—nothing to do with wheat or maize; though any one who has walked with a grain of either in his shoe may doubt it—corns are highly suggestive of a change of weather; at least so I am told, for I don't carry any of them in my boots. Frank Smedley, in one of his novels, mentions an aunt of the heroine as being “proprietrix of a highly meteorological corn.” Well, that is no superstition: the dampness or the atmosphere affects the pressure of the body, and causes a temporary disturbance of the whole system. If any parts of the body are in a morbid, or unhealthy, condition—a tooth, a corn, or a rheumatic bone—they will feel the change at once.

So sensitive are some flowers, that on the approach of rain, they will close their petals to protect the stamens.

You have often, I doubt not, observed Sea-gulls flying about, many a mile inland. They are the almost certain fore-runners of foul weather: they can't catch fish at sea; eat they must—a happy thought strikes them—plenty of earth-worms will be coming to the surface as soon as rain falls: let us go and eat them, as we cannot get fish. This looks like reasoning, does it not? If not reasoning, it is the exercise of memory transmitted from generation to generation.

The joyful little birds, too, cease their melodious warbling at each change for the worse. They feel a depression of spirits as we do. Charles Kingsley laughs at the idea of a man's feelings being affected by a N. E. wind; it may be that the strenuous Vicar of Eversley never yielded to such weakness; but if his liver was ever out of order, and it must have been, sometimes, one would think, it ought to have taught him charity towards his less “muscular fellow-Christians.”

I never wish to see a crow before the 18th of March. An earlier arrival invariably foretells a return of winter. In fact, the unusually early advent of all migratory birds is a bad sign.

I remember well the spring of 1874.—I find in my Journal of that year, that the first Robin (Thrush) was seen at Compton, on March 30th. Poor darling! how severely he must have felt his error in leaving his Southern abode, when he saw, the next morning, —12° F. on the thermometer! Swallows made their appearance on the 12th of April—on the 30th of that month 18 inches of snow fell, winter returned, and there was no pleasant weather until May 12th!

Now, birds leave the South because unpleasant weather has set in there—unfortunately, it follows them Northwards, and they are *dished*, as the late Lord Derby said of the Whigs when he passed the Reform act of 1868.

The weather in Spring may be taken as the key note of the whole season. Kirwan, a patient observer, says, that “in the course of 41 years there were 6 wet springs, 22 dry, and 13 variable.” On these data, he made out that a dry spring was followed by a dry summer 11 times, by a wet one 8 times, and by a variable one 3 times: a wet spring was followed by a dry summer not once, by a wet one 5 times, and by a variable one, once: a variable spring was followed by a dry summer 5 times, by a wet one 7 times, and by a variable one, once: so, in the beginning of any year, the probability of a dry

spring is as 22 to 41; of a wet spring, as 6 to 41; of a variable one, as 13 to 41. A February in which much snow or rain falls is indicative of a fine spring:

“February ill dyke, be it black (rain) or be [it white (snow): But if it be white “a the better to like.”

We won't say much about the rhyme, but the proverb is true enough.

“The hind would as soon see his wife on [her bier, As that Candlemas day should be bright [and clear. If Candlemas day be bright and clear, Half the winter's to come and mair; But if Candlemas day be dull and foul, Half of the winter was past at Yule.”

I need not tell you that Candlemas day is the 2nd February, and Yule is Christmas; but we must remember, what is usually forgotten, that these proverbs were invented when dates were reckoned by the *old style*—so in fitting them to our computation, we must regard them as speaking of the present 6th of January, and the 14th of February—St. Valentine's day; just as the Green Drake, one of the Ephemeræ, so dear to the trout-fisher, is, in England, still called the Mayfly, though it never makes its appearance till about the 14th of June. Another saying goes:

“March hock ham, comes in like a lion, goes out like a lamb:” i. e. good appetites, this month; wind at the beginning, fine at the end: true enough still; but the end meant is April 12th; and with this change, the proverb is as true in the central parts of Canada—London, Ontario, for instance—as it is in England.

In summer, when falling stars are numerous, thunder-storms may be looked for. If after a long spell of fine weather and the barometer high, the mercury begins to fall, it will generally decline gradually for two or three days before there is much sign of rain. A great fall of the thermometer occurs just before a hail-storm. Chickweed contracts its flowers, as do the *trefoil* and the *convolvulus*, before rain.

“If woolly fleeces (cirro-cumuli) strew the [heavenly way, Be sure no rain disturbs the summer day.”

And again: “If clouds appear like rocks and towers, The earth's refreshed by frequent showers.”

The proverbs are:

“A swarm of bees in May Is worth a load of hay.”

Not at \$15 a ton though!

“A swarm of bees in June Is worth a silver spoon.”

“A swarm of bees in July Is never worth a fly.”

A very true saying is the following, speaking of course of fall wheat:

“Look at your wheat in May And you'll come weeping away. Look again in June And you'll come home in another tune.”

The *Rain-bow*, interesting as its study is, must not detain us long.

“A Rain-bow at night Is the shepherd's delight; But one in the morning Is the shepherd's warning.”

A rainbow at night shows that the rain is falling in the East, and, as that is a dry quarter, it will soon be over. A rainbow in the morning, shows that the rain is falling in the West, the wet quarter, and is therefore likely to last. The appearance of two or three rainbows at once indicates

fair weather for the present, but foul weather with much rain two or three days afterwards.

Twilight signs are as follows: a blue sky, and the West, after sunset, covered with a purplish tinge, particularly if the atmosphere be smoky or hazy—certain fine weather.

When dense orange-coloured vapour covers the horizon, wind. If crimson or vermilion, wind with heavy rain. If green, a nasty green such as Homer calls (we have also no Greek characters) *chloron deos*, rain next day—whitish-yellow the same. When the sun sets in brilliant white light, showers. Aurora Borealis is due to magnetic disturbance, and indicates a change of weather.

This year, if you remember, we had a brilliant Aurora on the 7th of November, which may have been the cause of our being done out of our *Indian summer*.

And now, one word at parting: distrust every prediction of the weather that is based upon a pretended secret. The prophet is either an enthusiastic fool, or a charlatan, a knave.

In 1836, an impostor, Murphy, had the good luck to predict in his almanack that January 6th would be the coldest day of the winter.—right, for once, he was, and made, I believe £10,000 by the sale of his book; but the next year he was just as far wrong; and retired for ever from the public sight involved in a cloud of ignominy and contempt. May his fate be a warning to quacks of all sorts.

But place perfect confidence in the bulletins sent out from the observatory at Toronto. I have followed them by my own observations, and they are thoroughly to be depended upon. And why?—they are founded upon pure science.

I hope next year will see all over the Province a copy of these valuable prognostications sent by telegraph to every Post-Office, and placed under a glass case outside the building, so that every passer-by may see it. If it is put up in the public room of the hotel, it will not be half as useful.

The whole of your hay and harvest crop depends upon the weather; and I entreat you to believe that, owing to the paths followed by the winds and storms being constantly telegraphed to the Toronto observers, they are as capable of judging of the time when a change of weather will take place at Frelightsburg, as if their post was set up in the midst of your village—their honesty no one will dispute.

And it is no trifle, this weather, in hay-time and harvest: it is not only the furnishing of your own pockets, or the payment of your own debts that is concerned: it is the food of the nation to which you owe your birth, and, in part, the sustenance of that nation from which your ancestors sprang, which depend upon it. Every toward rain-storm, every unseasonable frost which occurs here, affects a population of 4½ millions of Canadians, and a population of 35 millions in the British Isles. It is your duty then as farmers, it is your duty as men with a fellow feeling for your brothers, to lose no chance of acquainting yourselves thoroughly with all the signs of the weather, that you may never be taken unawares. You have worked hard all the winter, spring, and summer, and now, when

“The wind, the rain, the sun, Their genial task have done, Wouldst thou be fed? Man, to thy labour bow, Thrust in thy sickle now, Reap where thou once didst plough, God sends thee bread.”

After the lecture, Mr. Deming put the question to the meeting: "Should hay be made more thoroughly for an outdoor stack, than if it is to be secured in a barn? This was carried unanimously in the affirmative; but it turned out, upon inquiry, that the stacks in question are more like what are called in Scotland "tramp pikes;" none of those present having ever seen an English stack of from 40 to 100 tons, trodden continually during its erection by from 8 to 10 men and women, well topped up, and pulled outside so that no loose hay remains: the finished stack, after sweating being so firm that the strongest man could not draw out a handful. The general opinion, after some discussion, seemed to be, that Mr. Deming, in his amicable dispute with me in this journal, was talking of one thing, and I, of another. Of course I am utterly impenitent, as I feel sure, upon scientific principles that no barn that ever was built can exclude air.

The following, letter, on "feeding cattle only twice a day," is from one of the largest, best known, and most prosperous cattle feeders in the province. (1) Dr. McEachran's letter, on the same subject, taken in conjunction with J. Mc's, ought to set the matter at rest.

Compton.

Dear Mr. Jenner Fust,

I received your letter asking my opinion of feeding cattle only twice a day. You say, I feed enough to know all about it. I have fed a long time (over thirty years), and fed for my living (not for pleasure), but I do not think I know all about it yet. As for feeding cattle only twice a day, I think it would not be good economy. I do not think it could be done so as to make the most out of the feed, which should be the main object of every feeder. Cattle left to their own way, will eat more than twice a day. And they should not be fed at one time more than they will eat. After they have eaten their fill from hay once, they will not relish the rest of it so well, and they should have fresh hay, and if they had but two feeds a day, it would be so long between meals, they would get hungry and very uneasy, and would throw off before the next feed more flesh than they put on by the last one - I cannot see the object of it, any way. Cattle need looking to more than twice a day in the barn, and they might as well be fed often.

It would be a nice thing to do, to give cattle at one time just the quantity they would eat and no more; for some days they will eat more than others. Some think if they throw then a great lot of feed, it is all they require, but it depends a great deal on the care they have, and if a man cannot give it them, he had better not feed them.

My method of feeding cattle is as follows: as soon as I can see in the barn without a light they are fed a good feed; and when I think they have had time to eat it, I go to them again and feed them what I think they will eat; just before noon I feed again. After dinner they are turned out to drink, and if any hay is left before them, it is taken away and given to colts or young cattle. As soon as they have all drunk, they are put up, and fed again, and left until just before dark, when they are fed for the night, at about eight in the

(1) The late Mr. John McCleary.

evening I go to see if they are all right, and if I think they need a little more I give it to them.

This has been my way of feeding for a good many years, and I have had very good success. I can make very good beef on hay and grass. I have some cattle now that have nothing but hay, and people ask me what I feed them on. Nothing but hay, I reply, and they will hardly believe it, but they have *hay* not *wood*. Some years ago, Col. Pomroy said my hay was not hay, nothing but grass; that is just what I want it to be - dried grass.

But cattle, to do well, must have the best of care, and it needs judgment too. I cannot give my men any rule to go strictly by, for I have, myself, to vary very often.

This has been quite a task to me, as I write but very little and this is my first attempt at any thing of the kind. I do not suppose I have written any thing that will be interesting to you. J. Mc.

I was much interested in your remarks on draining in the Journal: some time ago, I had a pasture that was somewhat too wet with surface water. My plan of draining it is this: I select the lowest places where is the most water, and plough four or five furrows, take a cart and draw them to a pile to compost with manure, then plough two furrows more in the middle, and cart that out, and also smooth it out a little, and so I have a ditch which answers the purpose very well; it does not fill up, and is not in the way of crossing; the water can run in from both sides, and if there is not too much water, the sides and bottom bear grass.

Markets in England.

Liverpool, Friday.—Holders of floating cargoes of nitrate of soda evince more desire to meet buyers, and several cargoes have changed hands at £8 10s. to £8 12s. 6d. for port-of-call and due cargoes, and November-December sailings at £8 5s. to £8 7s. 6d. per ton; spot values are maintained at £8 17s. 6d. to £9s., owing to the limited available stock; but there are sellers ex-ship due end of month at a large discount on these prices. A fair demand is experienced for superphosphate and kainit at unchanged values. The consumptive requirements of oilcakes continue extremely limited, and the unimportant sales that have transpired are at the following low rates:—Nitrate of soda, best quality, i.e., guaranteed to contain at least 95 per cent. of purity as per R.A.S. standard, in bags, £8 17s. 6d. to £9 per ton. East India bone meal, in bags, £4 7s. 6d. to £4 12s. 6d. per ton. Kainit, prime 23 per cent., in bags, £2 7s. 6d. to £2 10s. per ton. Linseed cake, American thin oblong, prime, in bags, £5 2s. 6d. to £5 7s. 6d. per ton. Cottonseed cake, N. A., decorticated, fair to prime, in bags, £4 to £5 per ton; cottonseed cake, English, undecorticated, prime, new seed, in bulk, £3 10s per ton. Rice meal, English, fine and guaranteed genuine, in bulk, 7s. per 240 lb.; rice meal, English, fine and guaranteed genuine, in bulk, 6s. 6d. per 240 lb.; rice meal, Rangoon, as imported, in bags, nominal. Linseed, fine bold feeding, in bags, £2 3s. to £2 4s. per qr., 416 lb. Superphosphate of lime, guaranteed 25 to 27 sol., D.N.S. brand, in bags £2 6s. 3d. to £2 8s. 3d. per ton; superphosphate of lime, guaranteed 34 to 36 sol., D.N.S. brand, in

bags, £3 3s. to £3 5s. per ton. Basic slag, best quality, guaranteed 28 to 35 per cent. phos., in bags, £1 16s. 3d. to £1 17s. 6d. per ton.—S. Downes and Co., Brokers.

HAY AND STRAW.

London (Cumberland), Thursday.—Prime picked hay, 75s. to 82s.; useful do., 60s. to 75s.; inferior do., 40s. to 60s.; clover, 80s. to 100s.; useful, 65s. to 80s.; inferior, 45s. to 60s.; straw, 28s. to 34s. per load; Canadian hay, 80s. per ton.—Dumbelton and Sons.

Whitechapel, Saturday.—Superior picked hay, 86s. to 90s.; good hay, 75s. to 82s.; inferior, 45s. to 65s.; best clover, 105s. to 112s.; good clover 95s. to 100s.; inferior, 60s. to 85s.; straw, 24s to 34s.—J. Gingell, Son, and Cruickshank.

LONDON MARKET.

For price of meat see below.

Cattle: Monday April.
Milk-cows \$75.00 to \$115.00.
Beasts:
Scotch 80 to 90 stone (8 lbs)..... \$1.12
Shorthorns, &c., 100 stone..... 1.04
Fat cows, " do -.90
Sheep:
Downs 7½ to 8 stone..... \$1.60
" 10 do 1.44
Lincolns 12 stone..... 1.32
Americans 8 do 1.32

Pigs:
Top value..... \$-.84

Strangely enough, Messrs. Fraser & Viger, St. James Street Montreal, advertise "Imported Wiltshire Bacon" for sale!

Calne, Friday.—Present prices for prime pigs, in lot of not less than 10, on rail within 100 miles of Calne.—

Prime stores. Thickness of Fat in Price any part of the back.
6 sc. 10 lb. to 9 sc.
10 lb..... 2½ in and under..... 7s. 9d
Under 10 sc. 10 lb. Not exceeding 2½ in 7s. 0d
Under 11 sc. 10 lb. Not exceeding 2½ in 6s. 6d
Under 12 sc. Not exceeding 3 in..... 6s. 6d

Any pigs outside these limits at their value. Half truck, 12 pigs; whole truck, 25. A special price of 9d per score above A scale will be paid for choice sizeable pigs, 6sc. 10 lb. to 7 sc. 10 lb. under 2 in. in thickness of fat, until further notice.—Chas. and Thos. Harris and Co., Limited.

REPORT OF MM. G. A. GIGAULT AND J. D. LECLAIR.

(Continued.)

CONCLUSIONS.

As a conclusion to our investigations we deem it well to make the following observations:

THE DAIRY INDUSTRY.

1st. To develop our butter trade with England it is absolutely necessary that the vessels doing the service between that country and Canada be supplied with refrigerators. It is also necessary to ship the butter weekly, that it may arrive fresh and without that stale taste which relegates it to the last class.

If Australia has been able to increase the exportation of that product, she owes it to the fact that the vessels carrying her butter are provided with refrigerating appliances.

The Government of New Zealand has even decided to erect refrigerator depôts in the four principal maritime

ports of that province. The ships that carry butter from other parts of New Zealand to those ports are also to have refrigerating apparatus.

That butter may remain good and preserve its flavor, it must be secured from the action of heat, from the moment it is made until it is delivered to the consumer.

2nd. In order that the Province of Quebec cheese may, as a whole, be received on the English market with the same favor accorded to our best specimens, it is indispensable that, while preserving the good quality existing and improving it where it is lacking, we can more quickly gain a uniform good quality, which nothing but the extension of cheese syndicates can ensure. The inspection service improves year by year, but there are still many obstacles in its way, the principal of which, at least, we will point out.

Too many small factories, badly organized, badly supplied with implements, where too little milk is received to permit of the engagement of an able cheese maker, and where the latter, in consequence, receives too low a salary to permit of his joining the syndicate.

The unfortunate competition between neighboring cheese-makers, who strive to see which shall produce the greatest bulk regardless of quality.

The directors of cheese factories should second the efforts of the inspectors and of the skilled cheese makers:

a. By putting in force the rule that all milk delivered at the factory be of good quality, strained and aerated, and by strictly obliging the cheese-maker to refuse all bad milk: public interest requires this course of action.

b. By being careful, in making a sale, not to deliver any cheeses of inferior quality, without giving notice to the purchaser, so that he may not run the risk of shipping to England lots that lack uniformity.

3rd. The provincial dairy-school should be enlarged and improved.

It should be provided with a laboratory, where the analysis of butter, cheese and milk could be made, as also with large and spacious cellars for the butter and cheese, wherein the temperatures and hygrometric conditions, favorable to the ripening of cheese might be explained.

The ripening of cheese is a very delicate matter, and such ripening should never be checked, for it takes place only under circumstances peculiar to each grade.

While admitting that certain of our cheeses deserve the complaints made by English traders, we cannot, however, expect that the cheese-makers will learn to conduct the process of ripening by "the tests of eye and thumb," without a knowledge of such tests. The knowledge of such rules will produce the same good effect as in France, where, since they succeeded in laying down the rules and conditions of ripening, it is found that there is 25 per cent. less of waste than previously.

The provincial dairy-school should be raised to a level corresponding with the importance of our butter and cheese trade. We cannot undertake to compete with other countries unless we place our school in a position to teach the most modern improvements. It is important that we should commence organizing complete courses, so as to familiarize our young people with all the theories of the art; there is nothing, it seems to us, to prevent our taking the necessary means of giving those young people, according to merit, practising diplomas. They would become competent heads of

factories, as do, in Denmark, the holders of diplomas from the practice school.

The pupils who follow a complete course at our dairy school, should work two years in such butter and cheese factories as are under the direction of makers whose abilities are recognized.

We can find out who are our best makers by means of competitions in dairy produce, similar to those organized by the Danish Government.

4th. A competition of dairy products, organized after the Danish system, would aid in improving the methods of making these products. The prizes there given should be diplomas, distributed amongst the butter- and cheese-makers and not awarded to the owners of the factories.

VARIOUS PRODUCTS FOR EXPORTATION.

5th. If we desire to increase our pork exports, we should try to produce a meat suitable to make bacon, that is to say not too fat; to fatten the pigs when they are young, and to kill them when they do not weigh over two hundred pounds.

This trade should be developed at the same time as that of butter, from which, moreover, it is inseparable. Producing milk, butter, and bacon throughout the year, the farmer would certainly find in the two industries an assured market for almost all his farm produce.

6th. The poultry export-trade is susceptible of development; it can be made remunerative to the raisers, provided the killing, dressing and packing are properly done. On this subject interesting details will be found in the appendix.

7th. Our apples are in favour on the English market; but if we wish to encourage the multiplication of our orchards and increase the production of fruit, without overcrowding the local market, our nurserymen and the owners of orchards should try to produce apples that can be shipped without being bruised, and that will keep a few months after having been picked, these apples should command attention by their quality and appearance.

The exportation from Canada of preserved apples and tomatoes has for some years been increasing.

UNIFORMITY OF PRODUCTS—REGULARITY OF SUPPLY.

8th. In England they attach the greatest importance to the uniformity of the products put offered sale. We found traders who refused to buy our butter and cheese, because they are not of uniform quality. A provision merchant said to us: "When we buy Danish butter, we are certain that, from the first to the last brick, it is good, while often your butter is of different qualities." Another added: "If you don't hurry up, in your province, so that every place makes equally good cheese, you risk being outdone on our market by producers who succeed in making cheese that is valued for its quality and uniformity."

This uniformity should equally exist in the case of our apples and of all our products.

English importers are never deceived with impunity. Exporters who sell as good that which is of inferior quality, or who mix bad with good articles, run the risk of having their goods rejected in future on the English market.

The French so well understand the necessity of uniformity that they assert the farmers', or factory, butter,

by working it over, so as to produce a uniformity of colour and taste.

First-class butter is placed in boxes of a certain colour, and second class in boxes of another colour.

9th. If, after the Danish example, we wish to get a hold on the market, we must supply it regularly; only on that condition can we be sure of a constant demand for our products.

INSTRUCTION IN AND DIFFUSION OF AGRICULTURAL KNOWLEDGE.

10th. In our agricultural schools, or, at least, in one of them, more importance should be given to the theoretical course, so as to not only form good farmers, but also to turn out lecturers well versed in the science of farming.

11th. The schools for instruction in the domestic economy of the farm house must be greatly increased. The Roberval School, founded only two years ago, has already rendered great service to the farming class. It would be well to encourage the establishment of other such institutions in the Province.

12th. An elementary treatise on agriculture should be published and taught in our primary schools.

13th. Our *Journal d'Agriculture* and our lecturers should become perfectly posted on the requirements of the local market and on the foreign markets where we exhibit our wares. It is not sufficient to produce in abundance; it is important above all to produce that which can be easily disposed of and at remunerative prices.

14th. The establishment of agricultural lecturers has done good service in our country and elsewhere to agriculture, and we must try to increase their efficacy.

PRACTICAL IMPROVEMENTS.

15th. The agricultural societies should vary their operations and encourage by premiums the most improved methods of cultivation and those best calculated to augment the fertility of the soil, as well as the amelioration of cow-houses, piggeries, yards, the establishment of liquid-manure tanks, and the making of composts. The cultivation of green fodder and of roots should also be encouraged, if we wish to develop still more the dairy business. These products are, moreover, indispensable for supplying, during the summer drought, the lack of sufficient pasture, which results principally from the too small variety of grasses sown in the country, which arrive at maturity about the same time, thus leaving only poor food for the cattle after the first flush is passed.

16th. It is conceded that the absence of lime in the soil is injurious not only to the production of grain, but also to that of those fodder plants which the cow needs in order to give a milk suitable for cheese. It seems to be equally conceded that there is a lack of lime in a large part of the arable soil, perhaps in one-half of our Province. It is therefore important that our agricultural associations should encourage the testing of the soil, so as to find out if lime is really wanting, or what effect its presence exercises on farm production and on the grasses that serve for cattle-food. (1)

17th. The existence of bad roads is very hurtful to agricultural progress and the dairy industry. The Danish system of improving roads should be tried.

(1) No analysis is any good except the practical analysis by test-plots. Lime does not act in a day or two, like guano or nitrate of soda, but takes at least a year to show its effects.—Ed.

18th. In Denmark, they are seriously occupied in replanting the country, and many Danish farmers have nurseries of forest trees. The forests of that country, composed generally of trees of the same kind and same size (having been all planted at the same time) produce a very fine effect. These forests are kept with particular care and the trees are from time to time pruned. (1)

We find, as to this subject, that it is very much to our advantage to continue the policy inaugurated this year by the Provincial Government, and to distribute yearly among the Farmers' Clubs seeds of forest trees, for the purpose of creating nurseries, and of planting some of our farms that are already denuded of trees.

FOREIGN COMPETITION.

19th. Finally, we will again remind our farmers that they have to meet on the English market with a strong competition on the part of the United States, of Denmark and of many other countries, and that they should strive not only to increase their crops and to diminish the cost of production, but also to produce goods of irrefragable character.

PRUDENCE.

20th. But, no matter how useful the improvement to be made, the farmer, before undertaking it, should consider his means. For, owing to having built too costly structures, some Danish farmers have placed themselves in financial difficulties that have led to their ruin.

Respectfully submitted,

G. A. GIGAUT.

J. D. LEOLAII.

APPENDIX.

Interviews of M.M. Gigault and Leclair with the representatives of the commercial and agricultural classes of the different European countries that they visited, and an account of the information given by these different people.

ENGLAND

Mr. HODGSON, of Liverpool, says that if Canadian cheese could be sold in England for 12 cents a pound, retail, the demand and consumption would considerably increase. The Quebec cheese is sold at a shilling less per cwt. than that of Ontario. Cheese that is imperfectly matured, on account of a too low temperature, which often happens in winter, the equipment of many of our factories being defective, should not be offered for sale.

Frozen butter does not sell better than that which is not frozen. Our butter is often too much salted, and arrives in England when too stale.

The Americans have better boxes for their cheese than we have.

Mr. G. NICHSON, of Liverpool, sells a great many apples preserved in tins containing about six pounds each. These preserves are made at Simcoe, Hamilton, and Cedar Spring, Ontario; these establishments belong to the "Simcoe Canning Co."

Marmalades and fruit jellies do not pay.

RICHARD BANKS, a butcher of Liverpool, received last year 102 tons of Canadian turkeys which he sold at 12 to 15 cents per pound. These birds were shipped with their feathers on. Geese should also be sent with their feathers and intestines, the importers

(1) Thinned cut?—Ed.

themselves dress the fowls; they should not be frozen, but thoroughly cooled before being packed. The head should be wrapped in paper and placed under a wing. The fowl should receive no food for 24 hours before being killed, so that the craw may be empty.

SAMUEL HUGHES, butter dealer in Liverpool: "Good Canadian butter sells at one or two cents less than Danish butter. Frozen butter does not sell as well as that which is only kept cold. Casks are preferable to tubs. Consignments of butter should be made weekly, and it would be well to mark them 'pure butter.' Canadian cheese keeps better than that of the United States. Cheese should not be made from skimmed milk. Bacon should be slightly salted and 'mild cured.' What is principally required in Liverpool is lean bacon, that is to say, with very little fat; in London, fatter bacon is used." Mr. Hughes says he prefers the hams unsmoked. (1)

Australian meats have lowered the price of bacon.

MACGEORGE & JARDINE, brokers and auctioneers of Liverpool: "The Canadian apples are the best; they are generally well packed by the Montreal fruit dealers. They should be uniform in size. We do not advise the exporting of plums. The Spies are the best apples; the Baldwins and Greenings come next. The Famenses sell well, but they are too delicate to be packed tightly in the barrels. The appearance of the fruit has a good deal to do with the price it brings. The apples should be shipped about the month of October, so as to avoid frost."

A visit to the Experimental Farm at Rothamsted, where we met the chemist, Sir Henry Gilbert. A vast laboratory is connected with this institution. For over fifty years, experiments, most important to agriculture, have been there made on the feeding of cattle, on fertilizers, as also on the different plants and grains. They have come to the conclusion that in the feeding of pigs, carbon hydrates help in the formation of fat.

This farm has several fields of wheat, dressed with different kinds of fertilizers; the meadows are also treated in various ways. At the time of our visit, some wheats were more advanced than others, and Sir H. Gilbert attributed the difference, as to some of them, to the various fertilizers used, their market value even varying according to the fertilizers used. The same thing was remarked in the meadows. Sir Henry recommends a moderate use of wood ashes for grasses, and above all for clover; he also advises that old meadows be dragged with a light harrow and rolled.

DOCTOR FREEM, member of the Royal Agricultural Society of England, and author of several works on farming, gave us the following answers to several questions that we asked him: In Canada, the late spring frosts, that often destroy the clover, will always be an obstacle in the way of permanent meadows and pastures; your indigenous grasses should claim your greatest attention and it will pay you to propagate them; some of them are earlier than others and should serve as a basis for your pastures; the addition of clover would suit very well. Farm-manure, especially if from animals fed upon oil cake, bran, and mixtures of ground grains would maintain fertility, while chemical fertilizers should only be used as required by the law of restitution, when not satisfied by the farm manure.

(1) That is, we suppose, that the smoking should be left to be done in England.—Ed.

QUANTITIES AND VALUES OF THE UNDERMENTIONED KINDS OF AGRICULTURAL PRODUCTS

IMPORTED INTO THE UNITED KINGDOM, FROM CANADA AND FROM DENMARK, IN THE YEARS 1881 AND 1893.

DESCRIPTIONS.		QUANTITIES.				VALUES.				DESCRIPTIONS.
		CANADA.		DENMARK.		CANADA.		DENMARK.		
		1881	1893	1881	1893	1881	1893	1881	1893	
Animals:										Animals:
Cattle	No.	44,349	82,925	61,735	.....	£ 965,947	(a) 1,465,005	£ 1,158,302	.....	Cattle.
Sheep	"	66,478	3,589	88,400	29,227	136,921	6,782	167,045	35,254	Sheep.
Swine	"	.....	137	9,287	.....	.....	411	26,901	.....	Swine.
Horses	"	24	1,815	2,975	1,764	1,125	72,054	20,681	16,159	Horses.
Meal:										Meal:
Fresh beef, mutton and pork	Cwts	60,295	81	.....	63,448	173,846	131	.....	128,239	Fresh beef, mutton and pork.
Salt beef and pork	"	9,146	9,221	(c) 12,662	(c) 66,865	15,999	16,522	(c) 29,678	(c) 77,674	Salt beef and pork.
Bacon and hams	"	99,740	251,553	18,556	719,124	214,611	667,314	60,717	2,171,299	Bacon and hams.
Other meat	"	7,460	7,438	.....	14,648	17,198	11,581	.....	(f) 15,123	Other meat.
Butter	"	78,192	43,160	279,625	934,787	385,069	191,924	1,691,891	5,278,875	Butter.
Margarine	"	.....	.....	.....	307	.....	.....	.....	880	Margarine.
Cheese	"	299,469	1,016,704	.....	51	814,616	2,575,893	.....	120	Cheese.
Lard	"	18,210	2,960	.....	6,682	50,885	49,452	.....	20,025	Lard.
Eggs	No.	.....	24,884,880	46,281,960	130,651,560	.....	75,506	124,011	376,793	Eggs.
Cereals, grains and meal:										Cereals, grains and meal:
Wheat	Cwts.	2,875,606	3,157,355	.....	1,339	1,625,769	1,043,905	537	474	Wheat.
Wheat flour	"	259,843	1,080,955	293,745	691	204,789	508,136	213,756	353	Wheat flour.
Other corn, grain and meal (including beans and peas)	"	3,729,470	5,075,463	1,539,262	640,721	1,232,685	(d) 1,377,256	117,509	(e) 217,150	Other corn, grain and meal (including beans and peas.)
Fruit (apples)	Bush.	(b) 203,104	482,997	.....	8,117	(b) 87,832	153,604	.....	2,114	Fruit (apples).
Skins, furs and pelts	No.	.....	.....	.....	.....	227,890	401,362	9,145	13,001	Skins, furs and pelts.
Wool	Lbs.	40,480	16,800	2,499,429	1,429,815	685	350	121,854	50,645	Wool.
						6,185,020	8,602,082	4,372,010	8,401,181	Totals.

* Cannot be given.
 (a) Not including the value of three calves.
 (b) 1882.
 (c) Pork only.

(d) Not including the value of 528 cwts. of meal other than wheatmeal or oatmeal.
 (e) Not including the value of 2,453 cwts. of meal other than wheatmeal or oatmeal.
 (f) Not including the value of 63 cwts. of preserved meat other than salted pork.

BOARD OF AGRICULTURE, LONDON, August, 1894.

The production of cheese takes a good deal from the fertility of the soil; this point demands our farmer's most serious attention, in their capacity of cheese-producers. The United States special reports, and particularly the bulletins from the State of Wisconsin, will give you the most complete information as to the effect of food upon the quality of pig's meat. According to the requirements of the market, whether demanding thick or thin meat, you must be governed in the breed of pigs to be raised. A study is now being made on the influence of food on the quality of milk, but the experiments are not sufficiently conclusive to justify a positive judgment. The breed and the individual aptitude of the animal count for a good deal.

ANDERSON & SON, cheese and butter brokers, London:

Although the quality of cheese from the Province of Quebec has been improved and the price has risen, that product is still inferior to the Ontario cheese; it is now selling in England at 45s, while that of Ontario brings 46s. 6d. per 112 lbs. The forms are not sufficiently regular; the wrappers are not so well adjusted, and the consistency is not so firm as that of the Belleville cheese. Often your cheese is not ripe enough: it is known by the name of "Joseph," or "St. Joseph." No cheese should weigh more than 72 lbs.; the retailers do not like to buy large cheeses.

WILLIAM T. PENNAL, dairy produce broker, London:

He will not buy cheese from our Province because the quality is not uniform. American cheese is better than formerly and sells at 2s. more than heretofore. Mr. Pennal sells bacon, and, according to him, long, lean pigs are preferred, those that have no more than 1/4 of an inch of fat on the

back; a flitch of bacon should not weigh more than 56 to 60 lbs.; price 56s. per 112 lbs. Choice Irish bacon sells at 64s.

A. J. Rowson, broker, London:

The Quebec cheese is too moist, it decreases in weight while crossing the ocean; it should be as mellow as bread. The Belleville cheese brings 2s. more than that of the Province of Quebec. Your cheese is too tender, and does not keep so long. I have in my store cheese made from skimmed milk on which I shall not make a cent, the price will not pay the cost of storage, etc. Some Canadian makes have too deep a color, which is not liked on the London market; the cheese must be either coloured or white; uniformity in weight is most needed (above all for cheese from your province).

Bad boxes have caused a loss of 1s. per 112 lbs.; the appearance of your cheese is far from being perfect.

The butter should be slightly salted, shipped, weekly in a cubic or square boxes, narrow at bottom than a top and containing 56 lbs.; it would thus find a good outlet: stale butter cannot bring a paying price.

Some dealers want to have cheese without the cloth wrapped over the surface; as to Mr. Pennal, he says that cheese with a cloth on the top and on the bottom is better protected; he prefers it so.

Poultry should be sent before Christmas, or in January and February, because the Christmas market is always overstocked.

Mr. TAYLOR, auctioneer, of the firm of Messrs. Knill and Grant, London, advises the placing of "Fameras" apples in small boxes encased in a large one. A box of tomatoes which we saw thus packed, and coming from Spain, arrived in perfect condition. The best apples are the Baldwins,

Greenings, Golden Russets and the Gravensteins; they should be despatched immediately after gathering, packed tight, and of equal sizes in each barrel. The highest price our apples brought was 15s. per barrel, the freight was 4s and the commission 1s. per barrel.

According to Mr. Webb, a large retail dealer, the consumers like butter totally without salt and without any strongly pronounced flavor. Thus, the Irish butter, which has quite a strong flavor, is not so much in demand in London as in Liverpool. To have a share in that retail trade, we must not neglect certain very necessary little niceties; but, above all, there must be perfect uniformity in each lot marked 1, 2 or 3. The London market requires a very dry butter, estimated on the average not to contain more than 14% of water. We have noted that the texture of the substance is often sacrificed in order to secure a dry butter; a little bead of brine should be found here and there on the probe, but not so as to fall off in drops, as we have often seen it do in Canada. The loss of flavor, a stale taste, an excess of salt and water: such are the faults we have to correct.

IRELAND.

MICHAEL EGAN, of Limerick, Ireland, uses milk, roots, grass and cabbage to feed his pigs. The pigs are sold 44s. cwt., live weight, but at that price the curers make no money.

JOHN McAULIFFE, farmer and owner of a butter factory in Limerick, uses for the feeding of his pigs chopped cabbage, scalded and sprinkled with a little ground barley; he adds milk thereto, when the cabbage is cold; cooked potatoes are good with milk. During the last 15 days he feeds grain

to harden the meat. He sells his pigs at 42s. the cwt., and gets higher prices for the young than for the old.

Every year he sells 16 to 20 crossed Chester-white pigs. They generally have about one inch of fat on the back.

The cows are milked during 8 or 9 months; they average 16 quarts (1) milk each, a day.

The pigs are killed when eight months old.

The best meadows and the pastures are dragged with a light harrow.

Wholesale price of butter: 15 cents per pound.

In winter, the cows get roots, mangels, and ground oats. Turnips are given to the cows when they are about to calve, after they have ceased giving milk. They also give carrots and turnips to the pigs. The potatoes are steamed.

Milk should never be added to the potatoes until they have become cold.

Here is a statement of the method of butter-making followed by Mr. McAuliffe:

The churn used is the "Danish vertical," and is stopped as soon as the grains of butter are formed; the butter is taken from the churn with a sieve and is plunged several times into a tank of cold water. It is then put on the worker that is turned for a minute, so as to let part of the water drain off. Then 1/2 per cent. of salt is added, which is incorporated by passing it under the worker for a minute or a minute and a half, when it is placed in a large trough until next day, to allow the salt to dissolve. It is then given another working to do away with the white spots, to take away part of the brine, and to bring the butter to the half-salted condition required by the market.

(1) 16 quarts=4 gallons=40 lbs. about 6,400 lbs. a year.

The butter is packed in square boxes with bottoms narrower than the tops, and which hold exactly 56 pounds each; it is protected from the wood-taste by parchment paper that completely surrounds it. Care is taken to make, with a hot iron, on these boxes "Pure Butter," or "Fresh Butter."

JAMES E. PHENIX, commission merchant, of Dublin: Bacon should not be fat; it should be slightly salted and made from young pigs. For bacon, the best pig is the half-bred Yorkshire, a long and lean-meated animal. Cooked food is preferable. Pigs should not be rapidly fattened. Pork is worth two cents a pound less when it is too fat. Irish bacon sells at 66s. the cwt., and American bacon at 48s to 50s., because the latter is too fat and greasy. (1)

MR. PATRICK CLUVE, professor of agriculture at the Glasnevin Model Farm, Dublin. He uses superphosphate for meadow-land. On the farm the manure is placed under cover of a simple shed without sides. There is also a liquid manure tank used to water the meadows and pastures. The carbohydrates contribute to a certain extent to the formation of fat.

A laboratory is connected with the school, where the production of pure ferment takes place. At the time of our visit there were 40 pupils, including girls and boys. This school is open all year round. The creamery includes a Danish machine and a large size "Laval," a Danish churn, a "Carson" worker, and a cemented vat for the reception of the cream-cans.

It is admitted that the thick cream, containing only a little milk can be churned in a temperature relatively lower, and that the ripening is easier, on account of the lesser quantity of alien ferments or of casein that it contains; that the preservative quality is principally acquired by means of proper and suitable ripening; the ferment of buttermilk in the preparation of cream is not very recommendable, because, properly speaking, it is never two consecutive days in the same state; that the milk should be pasteurized, above all, when it is affected or contaminated by the food or the air; that the sterilization of the cream gives the same result as if the milk itself had been sterilized, when it is only wanted for butter-making; that the second working of the butter makes it less salt and does away with the excess of moisture; that salting should be in accordance with the consumer's taste, and that the amount has little effect upon preservation. The milk should be strained before aerating, and the cowhouse be well aired, for it is impossible to have pure milk in cowhouses that admit pure air with difficulty. Silage, the odor of which is very strong, may be given without serious inconvenience immediately after milking.

RECIPE FOR CREAM-CHEESE.

Two pints of fresh milk and one pint of cream, at a temperature of 56° F. For each pint of the mixture add two drops of the Hansen extract of rennet, then shake until coagulation is at hand. Let it rest for 12 hours at 60° F. and hang it up 12 hours more for draining. Put it into proper sized moulds to make 5 cheeses per 3 quarts of the mixture. These little cheeses sell for 8 cts. each in Dublin. They are folded in paper placed previously in the mould. The mouth of the mould is somewhat smaller than the rest of it, so that the curd may be introduced without dis-

(1) Owing to being fattened on maize. Ed.

turbing the paper that lines the inside.

Chemical fertilizers are used for the improvement of permanent pastures; nitrate of soda, kainit, and superphosphates give the soil all it requires.

The average annual production of milk per cow is 7000 lbs., and it takes from 26 to 30 lbs. of milk to make 1 lb. of butter. The examination of the milk is made with a Babcock tester, and we have found a variation of from 2.7 to 4.8 per cent. between different cows, which shows that milk can be normal with a very small amount of fat, as well as with a larger quantity; and this also proves the necessity for every farmer to know each of his cows, and to improve his herd by selection.

In each herd the cows calve at different seasons, so that the production of milk is about uniform from year's end to year's end.

DENMARK.

MR. HOLM, chemist of the Copenhagen Government Laboratory:

To make pork suitable for bacon, Mr. Holm advises the use of a variety of food; milk, whey, buttermilk, barley, &c., 12 lbs. of whey or 6 lbs. of skimmed milk, are equivalent as food to one pound of rye or maize. Meat obtained by the use of skimmed milk is better than that procured from maize; the latter may, however, be given in moderate quantities when the fattening commences. Numerous experiments in the fattening of pigs were made under the government's direction, and the results are to be found in Mr. Boggild's work on the dairy industry in Denmark. Mr. Holm is convinced that the carbohydrates, *des sucres*, contribute to the formation of fat. The butter should not contain more than 14½ per cent. of water, and should be worked twice; if only once, it is too heavily worked, and the quality loses thereby. Work the butter, salt it, let it rest for several hours, and then work it again. The water used in washing butter should be boiled and cooled. Mr. Holm is of opinion that butter cannot be kept without salt. (1)

The exhibits of dairy products, organized by the government according to a new system, contribute in a large measure to improve and render uniform the quality of Danish butter. To reach its object more surely, the government, by one of its functionaries, sends a telegraphic request to any factory, which must send an exhibit by the first train for Copenhagen after the reception of the message. Several exhibits are asked for at the same time from different quarters, and are placed in an ice house connected with the laboratory; there, a few days after receipt (7 days), they are examined by judges who only see the outside of the butter, and are classified according to the opinion of the majority. Each judge must write out his decision without consulting his colleagues, and without knowing anything about the chemical analysis. The public is informed of the names of the butter-makers classed as 1st and 2nd, as to the others, they are informed, by private letter, of the faults found in their exhibits. It is well to add that all the patrons of the creameries have an interest in the makers according to the government's desire and producing a prize article. The value of the butter exhibited is paid

(1) Butter, and not very good butter either, is selling in St. Catherine Street, Montreal, for 35 cts. a pound. We are paying 28 cts. a pound for *Complan butter* of most excellent quality. Whence the difference in price? Simply the fact that the former is called *fresh butter*!—Ed.

by the government. It is remarked that the butter containing over 14½ per cent. of water is never considered by the judges as being first or second quality.

The Danish government has appointed a commissioner, who lives in England, and who is specially instructed to look after the interest of the Danish butter, as also to see that it does not serve as the basis of a margarine mixture, and to make known or report any complaints against such or such butter, as well as the faults therein.

MR. HOLM says that the preservative qualities of the butter are above all obtained by proper maturation of the cream, the other parts of the procedure being only secondary. He does not find fault with the method of extracting the butter-milk in the dry mode followed by some makers, but he thinks that water is necessary to extract the butter-milk.

According to Mr. Holm, the yield of crop per *tönde* of land (1½ acres) is as follows: 16 to 20 Danish *tönde*, (1) of wheat; 16 *tönde* of barley; 15 to 20 *tönde* of oats; 12 to 15 *tönde* of rye; 300 to 400 *tönde* mangels; 300 *tönde* of carrots; 3000 to 4000 pounds of hay.

MR. HOLM advises the paying for milk according to its richness, even in the cheese factories, which in any case is the fairest, for the more fat milk contains the more cheese it makes, and the farmers, who make judicious selections of the best milch-cows and who abundantly provide for their feeding, secure thus the profits of their labor.

In the course of a trip he took to Canada, M. Holm, found that the whey collected in our factories contains a great deal too much fat, perhaps three-quarters of one per cent.

Experiments have shown that, in the fattening of pigs, skimmed milk was almost as good as whole milk, because the fat contained in the latter does not produce an effect equivalent to its value. (2)

PROFESSOR SEGELCKE, professor of agriculture, expert in dairy business, of Copenhagen:

"The first dairy expert was named in 1868 by an agricultural society; later on, several other societies imitated the example. An agricultural crisis having supervened, the majority of those societies decided to dispense with the services of such experts. In presence of the good done by them, the government instructed them to continue in the duties of their office, and, since that time, it pays their salaries.

Any farmer may consult these officers and obtain from them information both as to the making of butter and the best methods to be adopted in cultivation in order to promote the production of milk. The farmers may form as many agricultural societies as they like; sometimes there are as many as two in one parish. The government subsidizes these associations. There are also societies for the purchasing of bulls and stallions. Many of these societies have frequent meetings and listen to the lectures given by the State farm-experts. The development of agriculture and of dairying is principally due to the spirit of association amongst the Danish farmers. The farm-experts of the State have also, by their lectures, greatly helped in obtaining this result.

Several associations have adopted the rule that a bull cannot receive a

(1) The Danish *tönde* is either 1.363 acres, or 28.855 gallons, according to whether it denotes land, or grain-measure.—Ed.

(2) And be so easily repaced by, say, 10 lbs. per cent. of linseed meal.—Ed.

prize unless he has been subjected to the tuberculin test.

Brooding horses has been more remunerative than it is at present; the taste for carriage and driving horses is more the fashion, and the Danish farmers should turn their attention in that direction."

MR. HENRY FORPACTOR ULERIO ("Sofiandal Farm"). Haslev, Denmark.

A large farm of 900 Danish *tönde* (1,200 acres), worked on an eight years' rotation.

The pasturing is on the tethering system. The watering is done twice daily by means of a vehicle, provided with a puncheon, which is used to fill the trough that rests with one end on the vehicle and the other placed on small wheels. The stable is floored in stone. The chain that holds the cow to the picket is 12 to 15 feet long and is attached to a head-stall on the cow.

The fattening pigs get barley-meal and a little grass; the sows get two or three pounds of meal daily and also some grass; in winter they are given mangels, also oat-meal when they have young ones.

During the winter the cows get barley and oat-meal, hay and straw. The milk is sold at Copenhagen, and the cows are milked at 4 a. m. and 4 p. m.

The farm keeps 156 cows, 50 calves, 4 heifers, 25 horses and 6 foals. The agricultural implements are ploughs, harrows, clod-crushers, cultivators, rollers, etc. The horses, also, are tethered at pasture. The cows that have lately calved are covered with a cloth or blanket to prevent any accidents arising either from the action of the sun or from chills.

N. PETERSEN, TAASTRUP (Kappeloogaard Farm). (1)

Extent of the farm, 168 *tönde* (228 acres). Thereon are kept 43 cows, 13 heifers, 1 bull, 11 horses, 4 foals, 3 pigs, 4 sheep. The pigs, food consist of barley meal and oats, clover and green oats chaffed; the sows get grain before farrowing and afterwards they have the same food as the others.

The breed is Yorkshire. The liquid-manure tank is seven feet deep; it is made of brick, clay, and Portland cement. The liquid manure is spread over the land at the end of March, as soon as the snow is gone and the grass begins to grow. Mr. Petersen grows this year about ten acres of carrots or beets.

ROTATION:

- 1st. Fallow, manured at the first fall ploughing.
- 2nd. Rye or wheat.
- 3rd. Six rowed barley.
- 4th. Carrots, mangels and potatoes, with half dunging.
- 5th. Two rowed barley.
- 6th. Oats.
- 7th. Hay, pasture.
- 8th. Hay, pasture.

There are ten *tönde* (13½ acres) of pasture that are not included in the rotation, and it is on this field that the liquid manure is spread. The fallow ground is ploughed and harrowed every month. With the oats, three different kinds of clover are sown to make artificial meadows. Mr. Peterson buys oil cake to the value of 650 kroners (\$175.57) each year. From experience he has found that orchard grass is superior to rye grass. This year he sowed a small piece of land, as

(1) *Gaard*=yard and *garth*, in our tongue. A. R. J. F.

a trial, of permanent meadow, with a variety of grass-seeds, according to the suggestions of Mr. La Cour. The stable yard and the manure-stance are paved with stone, so as to prevent all loss of liquid. The liquid from the stable manure is brought to the tank by means of a trench. In his experimental field of permanent meadow, he used 300 lbs of Thomas' basic-slag.

On an average, Mr. Peterson obtains 200,000 lbs. of milk a year, which he sells in Copenhagen for 5 ore (1½ cent) per pound. The winter food consists of wheat bran; 3½ lbs., ground barley and oats, 3½ lbs.; of oil cake, 1 lb., of hay and straw in various quantities according to the abundance of the one or the other. The horses do not get more than 3 or 4 lbs. of hay a day, the rest of their food consist of straw and oats—according to the work to be done—and carrots. The reason of this method of feeding is that the hay is kept preferentially for cows, the other stock get hay according to the yield of the year's crop. The manure is not under cover. There is also an ice house there, and all the milk is cooled before being sent to the city. At the time of our visit, the veterinary was examining the cows the milk of which was sold in the city.

J. C. La Cour, president of the Royal Agricultural Society of Denmark, and of the Agricultural School of Lingby Professor of Agriculture :

This school is generally attended by 80 or 90 pupils, from the 1st November to the 1st May, and by about 20 pupils during the other months of the year. It was founded in 1867, under the name of Landboakole; it receives an annual grant from the government of 6,000 kroners (\$1,522.22).

The first agricultural school in Denmark was established in 1858. Sixteen schools of the same kind now exist; each pupil pays from 35 to 40 kroners (\$9.50 to \$11.00) per month for instruction, board and lodging. The course of agriculture lasts from six to eight months; the average age of the pupils is 21 years; generally they are from 17 to 27 and even 30 years old; ten professors are connected with the school; each year, in summer time, a great number of rural school teachers attend for a month to perfect themselves in the science of farming. At the time of our visit there were about thirty of those teachers there; round each rural school kept by these latter is a field of about six to ten acres of land. Near the agricultural school are the experiment-fields and also a farm worked by M. La Cour; in the experiment-fields M. La Cour raises chickling-vetch (*Lathyrus sylvestris*), and prickly-comfrey. He has a fairly good opinion of the former, but he does not think that the latter can serve for any other purpose than for pigs-food. The farm manure is not under shelter; M. La Cour does not, however, condemn the covering of it. He has a liquid manure tank that receives the urine and the excess of liquid from the manure pile. To make meadows and pastures, M. La Cour advises the use of the following seeds: 10 to 12 lbs. of red clover, 1 to 2 lbs. of alsike, 6 to 8 lbs. of Italian rye-grass, 2 lbs. of orchard grass, 2 lbs. of timothy, 1 lb. of *holcus lanatus*. M. La Cour practises the soiling system, but for the health of the cows, he puts them out on pasture 15 days in June and 15 days in August. The cows are fed on straw, about 5.30 a.m., 3 lbs of wheat bran, 2 lbs. barley meal, mixed with 5 lbs. of different kinds of cake, rape, and cotton, a day; in summer green fodder, in winter roots; hay all the year round. Sometimes, in summer, the farmers give grain to their best milch

cows; the mid-day meal is given at 3 p.m. The stable yard is paved. After the evening milking, straw is given, and the remains serve for the next day's bedding. M. La Cour milks the cows that he is fattening, and believes it pays. The best fat cows sell at 15 to 20 kroners (\$4.00 to \$5.50) per 100 lbs.

The liquid manure is spread on the meadows and mangols, when there are signs of rain. The pigs he keeps are a cross-breed of Yorkshire and Danish, he gives them ensilage of mangol leaves, he thinks that cabbage is better than clover for pigs. To make bacon, M. La Cour advises a varied diet. He considers that 50 acres of land are enough to pasture and winter 40 cows. The horses are fed on 15 lbs. of oats, or rye, or ground Indian corn, 12 to 16 lbs. of chaffed straw, 6 to 7 lbs. of hay.

The yield in grain per tonde of land (1½ acre), according to M. La Cour, is: wheat, 14 to 24 tonde (1 tonde=3.827 bushels); oats, 32 to 80 bushels (a bushel of oats=35 to 38 lbs.); barley 40 to 64 bushels, rye, 40 to 64 bushels. M. La Cour attributes the heavy yield of the land to the fact that it is marled, that it gets a good deal of dung, and is particularly helped by fallows and hoed-crops. With the exception of Ireland, Denmark has the greatest number of cattle to the square mile of any country. After the fallow, the yield of wheat is always large, because the soil, worn with the rotation, rests from its labor, and takes in a fresh supply of nutritive substance for the coming rotation.

Eight year rotation:—
1st. Naked or whole fallow.
2nd. Wheat in heavy, rye in light land.
3rd. Barley.
4th. Roots (turnips, beets), or legumens, (peas, beans, lupins).
5th. Barley, partly for green fodder, if the cattle are soiled in summer.
6th. Oats with hay seed.
7th. Hay or pasture.
8th. Pasture or hay.

The fallows receive part of the manure, and are ploughed in November. In the spring, the harrowing roots up the weeds. In the second week in May, a second ploughing of 7 to 8 inches; harrowing and rolling, when the weeds begin to appear. In the middle of July, covering in of the manure by a third shallow furrow, harrowing and rolling again when the weeds appear; fourth ploughing at the beginning of September and the sowing of wheat or rye about the middle of September. Bastard-fallowing begins in mid-summer, and consists of three successive ploughings and harrowings, until the middle of September. The manure not put on the fallows is kept for the roots. Timothy and clover are cut in the middle of June; the yield of carrots is 40,000 to 50,000 lbs. per English acre; that of potatoes 300 bushels per acre. To make green fodder they sow together 2 bushels of oats, 1½ of barley, and 1 of vetches. For mangels the ploughing is done in the fall, early in the spring a brisk harrowing is given, and about 15 tons of manure, 200 lbs. of Peruvian guano per acre, and 100 lbs. of nitrate of soda are put on. They plough, harrow and roll; they sow 12 to 14 lbs. of mangol seed per acre. If weeds are feared, a little barley is sown between the rows; this latter coming up 9 days before the mangels, indicates the place where the latter are sown and allows horse or hand hoeing. (1)

(1) We always advise a little rape- or turnip-seed, mixed with the mangol-seed: this come up in 4 or 5 days, and shows the rows distinctly.—Ed.

PETER HANSEN, Langkjoegaad Farm, Holte:

Owens 89 tonde of land, equivalent to 117½ acres, 38 cows, which 24 are in milk, 6 horses, and pigs; a well lighted, well ventilated cow-house; paved in cement with a drain to carry the liquid manure from the manure heaps and the urine from the stable to the tank: a warm pig-gery, well lighted and cemented; an iron trough: the pigs are fed on barley meal. To spread the liquid manure he has two puncheons with taps affixed; there are ten acres of roots and potatoes, and 26 acres of meadow and pasture.

The butter was sold at 20 to 22 cents, wholesale, and 24 to 25 cents retail. The dairy has a cemented floor, and is under the house; the milk to be skimmed is placed in cans that are put into cold water. He has an ice house.

According to her books, Mrs. Hansen got the following quantities of milk and butter from her cows:—

	1889	1890	1891	1892	1893
Septem.	27	27	27	27	24
October.....	27	27	27	27	21
November....	27	27	27	27	22
December....	27	27	27	27	23
January.....	33	33	33	33	23
February....	32	32	32	32	26
March.....	31	31	31	31	26
April.....	24	24	24	24	24
May.....	21	21	21	21	21
June.....	22	22	22	22	22
July.....	23	23	23	23	23
August.....	26	26	26	26	26
Butter- milk.	10,677	13,676	12,667	11,877	16,167
Butter.	371 8/16	319	289	411	609
Lbs. of Milk.	14,700	16,773	15,833	15,271	19,078
Lbs. of Milk per lb. of Butter.	39.77	29.77	29.77	29.77	29.77
Revenue.	30.5	28	29	29	29
Expenses.	398.6	262	117	129.8	277
Net Profit.	12,183	7,860	3,276	3,741	8,033
Total.	14,424	14,424	14,424	14,424	14,424

BARON A. T. PFEIFF, Copenhagen:— Establishment for sale of milk, cream and butter. The milk is pasteurised at 176° F. during 5 minutes. The pasteuriser cost 800 kroners (\$216.30), but the proprietor intends to construct one in aluminium at a cost of 1500 kr. (\$405.55) and with a capacity of 5,000 lbs. per hour. The milk sells at 17 ore (4½ cts.) per pound; the butter at 120 ore (2½ cts.) per pound; the cream (1) at 1 kr. (27 cts.) per two pounds. JOHN HOFFMAN, Valby, (2) farmer. The farm is 100 tonde (133 acres). He keeps 46 cows, and sells his milk to a milkman. In winter, the feed consists of malt, beets, hay, straw and ground oats: in summer, malt (3) and grass only. The milk is sold at 5 ore (1½ cts.) per pound. The property with its buildings cost 270,000 kroners (\$70,000.00); the dimensions of the

(1) In our younger days, "Long Jim," formerly gamekeeper to Lord Swdney, Ranger of Hyde Park, London, used to sell the cream of twelve cows he had the liberty of keeping in the park, at 6s—\$1.50, a quart. —Ed.
(2) By is Scandinavian for residence; cf. Spillsby, Netherby, etc.—Ed.
(3) *Dræke*, here evidently means, *brewers' grains*.—Ed.

barn are, 44 feet wide, 160 feet long, 12 feet square; it is supplied with a ventilator and the floor of the cowhouse is cemented. The horses are fed on chaffed rye straw, carrots and ground grain; they only got hay when working. The stable yard is paved in stone; there is also a liquid manure tank that receives the liquid from the manure heap. This year, Mr. Hoffman has 7½ tonde (10 acres) under green fodder, oats, barley and lentils; 20 tonde (26½ acres) under hay and clover; the clover and hay are cut in the middle of June, and the meadow is then grazed; 5 tonde (6½ acres) under mangols; the meadows are watered with liquid manure. The hen-house apart from the other buildings; all the roots are at the same height from the ground. The yield per tonde (1½ acres): rye, 60 bushels; oats, 88 to 92 bushels; barley, 64 bushels; mangols 25 to 30 tons. The milkman kills, every year, about 18 pigs, when they are 8 months old; he sells them at present at 40 ore (10½ cts) per pound. Account of cows, from 1st May, 1892, to 1st May, 1893.

Revenue.	
Milk.....	\$3,216 76
Sale of 19 cows.....	532 90
Calves.....	44 61
Total.	\$3,794 27
Expenses.	
Purchase of 15 cow.....	\$ 732 70
Malt.....	664 30
Bran.....	186 87
Indian corn.....	60 67
Pollard.....	30 11
Grain.....	489 37
Stable boy.....	81 11
Total.	\$2,215 13

During the same period of time Mr. Hoffman sold the following products off his farm:—

Barley.....	\$837 79
Rye.....	271 40
Wheat.....	160 13
Oats.....	101 83
Straw.....	247 20
Total.	\$1,618 35

THE FREDERIKSUND CO-OPERATIVE CREAMERY.

The building is brick, and cost \$3,200; with the machinery it comes up to \$6,200. The brick chimney is about 50 feet high. This creamery receives milk from 59 patrons. Apart from lodging, and the milk and butter that he requires, the butter-maker gets a salary of \$675, but he must pay his men. The patrons pay for the salt, the tubs, and the other expenses of the work.

From the month of November, 1893, to the month of May, 1894, this establishment received 1,071,513 lbs. of milk; it received a smaller quantity during the six months from May to November, 1893.

Each farmer receives about kr. 3.15 (85 cts.) per 100 lbs. of milk. The farmer pays 3 ore (4 cts.) per 4 lbs. of skimmed milk. The price of butter is 85 ore (23 cts.) per pound. The cream, collected in cans, is carried away as fast as skimmed, to be cooled in a cemented basin, where the water is kept at a temperature of 50° F. Being cooled to 51° or 53° F., one and a half hours after skimming, it is then poured into two tubs, with two cans of the previous day's cream, and kept at a temperature of the apartment, so that it may sour of itself. This latter is used as ferment, and is added

about noon in the proportion of 12 per cent. That which we tasted was a great deal more sour than churned cream; the latter had a slight acid taste that was very agreeable. The temperature of the cream in the tubs never rises above 51° F.; at evening it is again placed in the cans, so as to cool in the cemented basin, at a temperature of 50° F. The working room gets no sun, and a uniform temperature can be easily maintained in it. The two cans of cream intended for ferment are skimmed. The skimming is done at a temperature of 64°.50 F.

The AA Danish machines make 2,800 revolutions per minute and separate 1,800 lbs. per hour; the cream percentage is from 10 to 15. A grating covers the machine so as to prevent dust or other filth from falling into the milk; a mechanical agitator prevents the whole milk and the skim-milk from sticking to the sides of the boiler; everywhere the skimmed milk that is returned is heated to 158 F.

Coloring is added to the cream before churning, but the butter is no deeper in hue than ours. The churns are rinsed before receiving the cream. At the time of our visit the churning, begun at 6.25 o'clock, at 50° F., was finished at 6.52, at 53° 6 F. A can of cold water at 50° F. is poured into the churn, and the butter is taken out in small, fine grains, by means of a sieve, and put into a barrel filled with cold water at 50° F. It is then placed in a wooden trough, in the same room as the worker, to allow it to drain, for about half an hour. Next, it is placed on the worker for two minutes; then it is replaced in the trough to be salted at a proportion of 4 per cent; the salt is incorporated with the butter by kneading with the naked hands. It is again run for two minutes on the worker, and collected in a basin, where it rests for an hour and a half or two hours; after that time has elapsed, the butter is again worked and is at last placed in firkins.

The butter was more soft than firm, yet it had a sufficiently clear brine. The butter of the day before seemed to contain quite as much water as does ours, when it is well made, and could be classed as half-salt butter. The upper layer of the butter in the firkins is levelled with a pallet, and the parchment-paper that lines the inside of the cask is brought in regular folds to the centre of the surface. All the manipulation is done with bare hands.

The firkins are sometimes sent back empty and refilled. The farmers bring more milk in winter than in summer. They are paid according to the percentage of cream calculated by the Fjord tester.

In winter, to make a pound of butter, they require 26 to 27 lbs. of milk, in summer 27 to 28 lbs., and in the fall 24 to 25 lbs.

O. H. PETERSEN, farmer, of Fredricksund:

He has a farm of 40 tønde (54 acres), 7 cows, 7 calves and heifers, 2 horses, 4 sheep, 10 pigs.

SEVEN YEARS ROTATION.

- 1st. Fallow.
- 2nd. Rye.
- 3rd. Barley.
- 4th. Roots, carrots, potatoes.
- 5th. Oats.
- 6th. Hay and clover.
- 7th. Hay and clover.

This year there are 10½ tønde of pasture and meadow, 1½ tønde of carrots, and 5½ tønde of potatoes.

The cows give milk during ten or eleven months. They calve at different periods. On an average they give 4,000 to 5,000 lbs. of milk per year.

Mr. Peterson sells 16 pigs per year. In 1893 his receipts were... \$1,081 21 Expenses..... 548 73

\$ 532 48

Amongst other expenses were:

State tax..... \$58 18

Municipal tax..... 17 31

\$75 49

In winter the cows get hay and carrots. During the same season the horses get grain, carrots, and chaffed straw. He sells his pigs at six or seven months old, when they weigh 200 pounds. The price is 41 ore (11 cts.) per pound.

YIELD.

Potatoes, 80 to 100 Danish tønde of land.			
Carrots, 130 " " "			
Oats, 14 to 18 " " "			
Barley, 12 to 15 " " "			
Rye, 16 to 18 " " "			

The piggery is in stone.

PETER HOLM, Lerchenfeld, Kallundborg.

Extent of his land, 550 tønde (734 acres).

ROTATION.

Two kinds of rotation, one for heavy and the other light soil.

For clay land the rotation is as follows:

- 1st. A fallow, of which one-third is used for green fodder, oats, barley, peas and tares.
- 2nd. Wheat.
- 3rd. Two rowed barley.

(To be Continued.)

POULTRY AS A PAYING INVESTMENT AND OTHER SUBJECTS DISCUSSED.

THE CONVENTION CLOSES.

Poultry as a paying investment for the farmer was the first subject which occupied the attention of the Canada Agricultural Association's convention yesterday afternoon. Mr. A. G. Gilbert, of the Ottawa Experimental Farm, gave valuable information and interesting figures on the subject. Success in poultry-keeping, he said, depended upon several conditions. The hen must be looked upon as a machine for the production of merchandise. Cut green bones had been found by experiment to be the best egg producing food for fowls. These are the bones which butchers give away but they are rich in the substances which constitute an egg. In summer time when allowed to run about fowls can pick up all the necessary foods but in winter the keeper must provide them. The hens should not go into winter quarters too fat. If they are fed too much they will not lay well. Water, not too cold, should be liberally supplied them. The proper age for laying stock varies with different breeds. Minorcas, Leghorns, and Hamburgs, may be profitably kept for three years, but Asiatic breeds, Langshans, Brahmas, and Cochins should not be kept longer than two and a half years of age. Feeding the hens upon cut green bones and keeping them warm all winter are sure to produce good results.

Prof. Craig, of the Central Experimental Farm, told the convention some excellent facts regarding diseases in vegetables, cereals and trees. Smut in oats and barley was a disease which was carried over in the seed. If the seed were properly treated and the soil cleared by rotation of crops, clean seed would be obtained the

following year. A method by which smut spores in cereals could be destroyed was given. It was done by soaking the seed for five minutes in a solution of copper sulphate and water at a temperature of 133 degrees Fahrenheit, the strength of the solution to be one pound of copper sulphate dissolved in a gallon of water. After immersion in this solution the grain should be dried, and this might be facilitated by sprinkling it with lime plaster or air-slacked lime. Potato scab, Prof. Craig said, was due to the presence of a parasite fungus. While experiments at the Ottawa farm for the remedying of this disease had been successful it was desirable on account of the contagiousness of the disease to select clean potato seed when planting. A scabbed crop will always follow the use of scabbed seed. The disease cannot remain in the soil more than two years, which is a point in favor of rotation of crops. The disease, however, would also affect beets so that these should not be used in the rotation. To a certain extent the use of vegetable manure spreads the disease. The disease might be prevented in a large measure by soaking the seed in a solution of corrosive sublimate, of the strength of two ounces to fifteen gallons of water, for an hour and a half. Spraying with the Bordeaux mixture of six pounds of copper sulphate and four of lime to forty-five gallons of water, had been found to be the best preventive for early or late potato blight. Three sprayings at least should be given during the season, the first about the end of July. The addition of soap to the mixture makes it a good preventive of the potato flea beetle. Sixty gallons of the mixture will spray an acre.

During the afternoon it was announced that the subject of the coming year's prize essays should be roots and their cultivation, including the preparation of the soil, manuring, harvesting, preparation and utilization of the crop. The essays will be limited to seven thousand words and must be in the hands of the secretary before Jan. 1, 1896. Two prizes of \$15 and \$10 will be given.

COOKING FOOD FOR COWS.

There has been some writing lately about the advisability of cooking some portion of the food of our milk cows during winter time—especially such a winter as we are just passing through—and it will do no harm to open up and discuss the subject a little once more. In order to prevent misapprehension, the methods of preparing foods for cows by heat may be classed in one or other of four different ways, which I define as follows:—(a) Actual boiling in a boiler or copper for an hour or so, (b) steaming a dry mixture of chop, &c.; (c) steaming a sloppy mixture; (d) soaking or infusing with boiling water. Any one of these may be combined with the others; and the particular class practised depends entirely on the apparatus used, and also on the particular way of using it. So far as I have read or seen in practical work, the last one of these is the best; by that I mean that the boiling of the water alone, and pouring it on to a trolley full of chaff, meal, &c., filling it up with water and letting it sit to infuse and soak for several hours, gets the maximum benefit with the least trouble and expense, and the least amount of apparatus.

To prove this it is necessary to digress a little, and discuss the value of

cooked versus raw food in the animal economy. Everyone has heard the statement that raw meat is more easily digested than that which has been cooked, and has seen this put into practice by many at public dinners and hotels; and one has often to put it into practice oneself when a half-raw chop is set down to one unless it has been ordered to be "well done." But in the case of our farm animals the matter has been tested over and over again by experiment. I cannot now lay my hands on the papers, but from memory I can state that this point has been tested in the case of both cattle and swine many times at the experimental Stations in the United States; and, lest this is not sufficient evidence for unbelievers, I may also point out that the value of cooking has been tested at Rothamsted. The universal testimony is that cooking—that is, thorough boiling—is of no value in making the material of the food more digestible, or in helping the digestive organs to extract more nutriment. In fact, it has the opposite effect, by coagulating or thickening some of the constituents of the food—as we see it doing in the case of a hard-boiled egg—so that in some cases better results have been obtained with raw food. This means that boiling the food, either in a boiler or by any method of steaming, is no benefit at all, and may be actually reducing the value of the food, while the daily work and expense is greatly increased.

In the light of the above it may be asked why we should use heat in the preparation of the food at all. The answer is that warmth promotes the comfort of the animals, and stimulates the flow of milk, in contradistinction to the evil done by, say, frozen roots as the other extreme. Also hot water destroys any mustiness in the fodder employed, produces a grateful flavour for the palate of the animals, and in the case of chop, for instance, brings out a magnificent aroma which must please the animal greatly, and help not a little to their milking produce. These things may be, of course, obtained by steaming or boiling; but my point is that these latter are roundabout and expensive ways of doing what is equally well accomplished by simply boiling a copperful of water (one that is set up high enough, of course), turning the rock, and letting the boiling water run on to the trollies filled with the chop mixture—the quantity being perhaps eked with some cold water.

Dry steaming is a complete mistake, for cows require three pounds of water to every pound of dry food, and the turning on of a jet of steam into a pan or vessel of dry chop, which only gets wetted with the condensed steam, is not preparing food to suit the digestive organs of the cows, if it does make it warm and palatable; while the apparatus is costly to set up and troublesome to handle.

With what I may call wet steaming any degree of preparation may be made, from simple warming up to actual boiling; but then all the benefits are obtained by simply boiling the water as described above, while all the costly erections of a steam boiler and pipes is avoided.

A very simple matter may make a great difference in the daily work of the attendants, and it is good policy to reduce the labour as much as possible, while at the same time doing away with the necessity of erecting costly gear; and, so far as I know, we get all the benefits with the simplest and cheapest system.

P. McCORNEILL

FOOD AND FAT.

We have heard a good deal lately about the effect of feeding upon the quality of milk, and many people state that it is the breed which entirely controls the richness of milk. Why, then, do city dairymen stipulate sometimes that their suppliers shall not feed their dairy cattle upon brewers' grains? How is it that any man who receives the milk of 500 cows or more, and samples and analyses each batch of milk every day, letting his suppliers see that such sampling is scrupulously carried out every time milk is received, finds that the percentage of fat in the milk rises by 0.5 to 1.0 per cent, when the cows are turned upon the after-grass in autumn? The results may not be so striking in some districts, but they are by no means over-estimated for the rich pastures of county Limerick.

Ag. Gazette.

TOTAL COST OF GROWING WHEAT.

The grower of wheat is in great straits owing to the present low prices. Four quarters is above an average crop, and can only be obtained upon fair land in tolerable condition. At the miserable prices lately prevailing there is not a prospect of much over £4 per acre, and from this 20s. to 25s. is necessarily incurred in securing and delivering the crop. Another 25s. is needed to pay rent, rates, and taxes, even when rents have been reduced.

We again produce an estimate, feeling sure, however, that it errs on the side of being too low:—

	£	s.	d.
Carting and spreading dung	0	9	0
Ploughing and pressing or rolling clover ley	0	12	0
Six harrowings at 5d	0	2	6
Drilling	0	1	10
Harrowing after drill	0	0	6
Seed—Three bushels at 3s	0	9	0
Pickling and bird-scaring	0	1	0
Spring harrowing and rolling	0	2	0
Weeding	0	1	0
Harvesting, thrashing, and delivery	1	2	4
Rent, rates, and taxes	1	3	0
	£4	0	2

We have charged nothing for interest or incidental expenses, and yet there is no sign of profit. In this case it is possible that the previous clover crop has left a balance in the form of hay. If we had taken as our example wheat after roots 20s. would have been needed to represent the cost of the roots over their value, and a loss of £1 on two years' trading would have been the result.

Important Notice to Breeders of Hogs.

—We have to report a continued good demand for lean bacon for export and we expect this will continue for the rest of the year with probably advancing markets. We are paying five dollars and fifty cents (\$5.50) per 100 lbs. for live hogs, delivered East End Abattoir, Montreal. The hogs bringing this price are long, lean bacon hogs weighing between 140 and 190 lbs. live weight, about eight months old. We believe the Yorkshire breed gives the best bacon hogs. Any hogs not coming up to above standard will be bought by us at market price. We are paying four to five cents per pound for well-fatted steers, weighing from 1100 to 1600 lbs., according to quality.

Yours truly,

THE LAING PACKING & PROVISION CO., Ltd.
Correspondence invited.

NOTES AND NOTICES.

A **Printer's Errors**.—A Broadcast Seeding machine was advertised last month by M. Moody & Sons, Terrebonne, Qaa., but by some errors of the compositor the improve-

ments made by them in this machine were not intelligibly mentioned. Messrs. Moody do not use foot cups at all in their machine to sow the grass seed, as they say the cups are apt to grind the grass seed, instead of the cups they are using a much simpler and yet a thoroughly perfect device. The grain box in their machine has been much enlarged and will now hold two bushels of grain easily; other improvements have also been made. Full information regarding the machine in question may be had from any of their local agents throughout the country or from their depot at Montreal, 12 Le-Royer St., or from their head office and factory, Terrebonne.

We beg to draw the attention of our readers to the advertisement of the Manufacturers' Life Insurance Co., on our first page. Observe the following: As it is not possible for a man to foretell with certainty how he may be circumstanced 15 or 20 years hence, the privilege of selecting at the expiration of the Endowment Period any one of the many benefits or options which are offered under an Endowment Policy is an exceedingly valuable one as the insured can then elect to surrender the policy or re-adjust it in whatever way he may find most advantageous. The option of surrender, which gives the insured the benefit of every dollar in the Company's hands in any way pertaining to his policy, forms the most valuable feature of life insurance. The policies of the Manufacturers' Life are printed in clear, large type and couched in plain, simple language which may be understood by all. They are as liberal in their conditions as it is possible to make them, consistent with safety and equity to the holders of them. We cannot too highly recommend our readers to insure as much as possible on the Endowment system of this Company.

—A merchant residing at Base St Paul, writes as follows under date March 16 1895. Dr. Ed. Morin & Co., Quebec, Gentlemen: I have used your Wine Creosote in a case of Acute Bronchitis, and a few doses only gave me great relief. I cannot recommend it too highly to all persons suffering from neglected Coughs or Acute Bronchitis. Please accept, gentlemen, my sincere thanks.

PHILIPPE GAGNON, merchant.

—We notice W. F. Vilas is rapidly coming to the front with his varied line of Agricultural Implements, which appear to be giving universal satisfaction; Mr. Vilas has just completed his new works at Cowansville, Que.,—having removed there from East Farnham,—to secure the improved shipping facilities that his large and increasing business demands. He has now one of the finest equipped Implement Factories in the Province, and we predict for him the success such enterprise deserves.

—Mr. H. E. Williams, of Sunny Lea Farm, Knowlton, P. Q., who took one of the gold medals in Chicago on his butter, scoring 98 points out of a possible 100, showed the writer his very fine herd of Jerseys, consisting of about twenty pure-bred, and nearly as many grades. Several of his pure-bred cows are descendants of the celebrated St. Lambert stock, headed by Baron Hugo of St. Ann's, which took the first prize as a yearling in 1893 at London and at Ottawa, and second prize at Toronto. His sire was H-be's Victor Hugo 16333, full brother to Sheldon, sire of Maggie Sheldon, 21 lbs. 5 oz. The dam of Baron Hugo was Dora of St. A.; sire of Dora was Orloff's Stoke Pogis 11157, considered by many to be the best Lord Lusgar bull alive, dam of Dora was Empress Carlotta. Baron Hugo is a handsome dark fawn, and certainly a grand bull. Mr. Williams is carrying on his operations with great enterprise.

—The demand for registered Jersey stock has increased rapidly with us in the past year and why should it not, as dairying is the most lucrative business for the farmer at present, and at the great World's Fair dairy test the Jerseys took the lead. We have made a thorough practical test of our herd, (with the Babcock tester), and find several cows who test as high as 7% butter fat and none less than 5%. It has been our aim, since the herd was established 25 years ago, to produce cows which would give a large quantity of milk, rich in butter fat, and I think we have nearly accomplished the fact. The world has yet to see the breed of cattle that can defeat the Jersey as a dairy cow. Fanciers of the Jersey cow always welcome at the farm, and those who do not believe in the Jersey breed come and be convinced by practical illustrations. B. P. BALL, Lee Farm, Rock Island, Que.

—Robert Davies, proprietor of Thorncliffe Stock Farm, Toronto, on 16th May next, will hold a special sale of his entire herd of Shorthorn cattle, consisting of 12 bulls, among them being the celebrated Imp. Cruickshank bull, 'Northern Light' (57801)—IIIII—and

SHORTHORN STOCK SALE.

THORNCLIFFE STOCK FARM, TORONTO, ROBT. DAVIES, Proprietor.

Entire Herd of Shorthorns will be sold by Public Auction on May 16th, 1895, at 12 o'clock (noon). Among the Bulls are the celebrated Imp. Cruickshank Bull, 'Northern Light' (57801)—IIIII—by 'Standard Bearer' (5509); dam 'Nouparell' 20th (4614); also, the celebrated Bow Park Bull 'Lord Outhwaite'—16787—by 'Butterfly Duke 14th—14278,—dam 'Lady Isabel' (Imp.)—5156—by 'Crown Prince' (33601), and several young Bulls and heifers sired by the above.

Also, a lot of grandly bred Cows in calf.

Write for Catalogue. 6 95 11

the celebrated young Bow Park bull, 'Lord Outhwaite,' who took first prize and sweepstakes for best bull, any age, at Toronto show last fall; also a lot of choice cows in calf, and young heifers by the above bulls. This will be a great opportunity for breeders to purchase some of the best stocks on the Continent. It will also offer for sale on the same date, some of his fine registered thoroughbred Shropshire sheep. Catalogues will be forwarded on application.

AYRSHIRES FOR SALE.

Young stock of both sexes, sired by Silver King 6897, and a Chieftain of Barch 5362, for sale at reasonable prices. Write for prices or call and see my stock D, DRUMMOND, Jr., 5-25-12 Petite Côte, P. Q., near Montreal.

PINE GROVE FARM.—Chester White Swine.—Young Stock of the above for sale at reasonable prices. Satisfaction guaranteed. Correspondence so invited. Address, 5 95-14

ROBERT J. MACLEAY, Castellar, Que.

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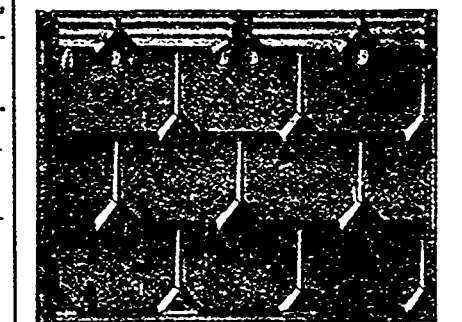
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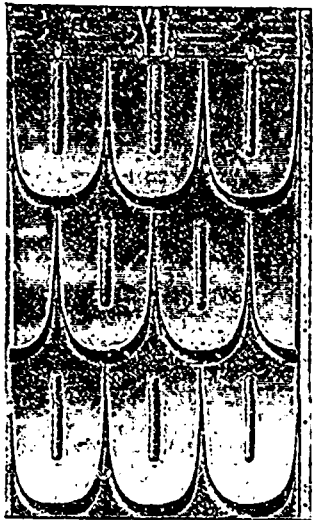
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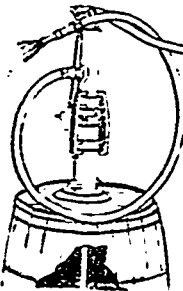
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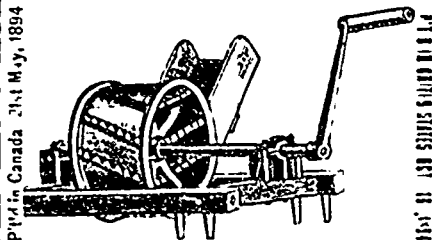
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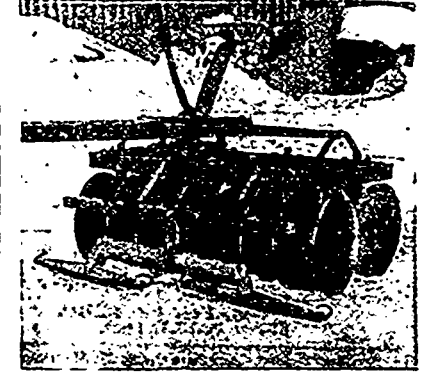
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More than have been sold by all the other factories in Canada put together and doubled. I have this day bought from M. Michel Lesage, agent for Mr. Manson Campbell, a Fanning Mill with bagging attachment. I have well tested it and am convinced that it will give full satisfaction to all those who will have the advantage of using it. J. N. TESSLER, Prop., Canon and Rector. Louisville, 3rd October, 1894.

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