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# THE ILLUSTRATED JOURNAL OF AGRICULTURE

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## ENGRAVINGS.

Jersey cow — Guernsey bull — Agricultural implements.

## Allender on Dairying.—Continued.

### ANTISEPTICS AND CONDENSED UNSWEETENED MILK.

There is a trade springing up which, if not checked, will drive just another nail into the coffin of British agriculture. I hold in my hand letters from some six or eight firms, dating chiefly from Holland, offering to send fresh milk to London. Fresh milk, indeed! fresh in the sense that we see advertised. "Preserve your milk and cream"—"Will keep milk good for fourteen days." This is by means of various chemical compounds, some of them fairly harmless, doubtless, to healthy adults, but how about invalids and delicate or very young children, whose principal food is milk? Can any one say that a daily dose of a strong alkali, no matter how small the quantity may be, may not have serious, if not *fatal*, consequences in some cases?

I say, the use of such means to palm off *stale* milk as *fresh*, is nothing less than a swindle. Take Glacialine, for instance. The specification in the patent, No. 3,107, A.D. 1876, says it is a compound of hydric borate, which is boracic acid; sodic diborate, which is ordinary borax; glycerine (the presence of which in a dry state is an impossibility); and white sugar. This is not the language, literally, of the patent specification, but it chiefly consists of interpolated remarks by the author of the paper. Well, our great grandmothers knew all about borax. In its several forms it is an excellent antiseptic; it has been known for years, only, people who desire to use it might just as well buy it under its own name and at its own price. And inasmuch as Glacialine is generally sold in the form of powder, and as glycerine cannot be produced in a dry state, it follows that it may be taken for granted that the mixture sold under the name of Glacialine does not contain glycerine; and as the specification says that the sugar may be used or not, the whole thing resolves itself into borax and boracic acid—substances as common as ordinary salt, and known for ages before the date of this patent. The speci-

fication goes on to say that, to preserve meat, nitrate of potash (which is ordinary saltpetre) and common salt may be added. I refer to this special *preservative* because its merits are being puffed, and even so good a writer as Mr. Livezey, of Preston, has been recommending it. No preservative is required by honest traders, for fresh milk, and it is only playing into the hands of the foreigner to advise the use of it.

Milk, to be sent from Holland to keep sweet until consumed in England, must be *doctored* in some way. Our public analysts ought to look to that. The latest dodge is the use of unsweetened condensed milk, chiefly from abroad, which is kept *till wanted*, and then diluted to the specific gravity of ordinary milk, and sold as *genuine new milk*.

That the trade is a growing and profitable one, may be gathered from the circular just issued by a firm doing a most extensive business:—

October, 1881.

Sir,—In compliance with the request of a large number of our friends, we have added the sale of condensed milk to our business, and are now prepared to supply you with any quantity you may require. Should you like to see how this milk *mixes*, we are always prepared to shew it to you here, or, if you prefer it, make an appointment, and our Mr. ——— will have great pleasure in waiting on you and shewing you a sample.

Among the advantages that we offer you are the following.—

The milk is perfectly unsweetened.

If unopened, we guarantee it to keep for at least three weeks after we deliver it.

I see that one of these foreign companies, formed for the manufacture of this commodity is being "*wound up*," and a good job too.

### "EDUCATION."

I cannot finish my task without saying a few words in reference to the lamentable failure of my scheme to establish a dairy school. It was a bitter disappointment to me, because I knew it was the right thing to do, and that, could we have succeeded, the school would have done useful work, and have supplied a great need. I have the satisfaction of knowing that my views are shared by men who have a *right* to express an opinion in such matters. Like all failures, our "*defunct friend*" has had a few kicks; but these have come from persons to whom Dr. Watts' line may be applied—

"For 'tis their nature to."

There is the fact. Other countries have schools in which the practice and science of the dairy is not only taught, but *studied*; and in those countries remarkable progress has been made, while we, who have not a dairy school, have been beaten by countries that have.

A writer in an American paper lately said:—

Men have carefully studied the subject, and made known the results of their inquiries and investigations, and now the business is reduced to an exact science almost. Chemistry, mechanical arts, and ingenuity have contributed much to this end, and there is no telling to what stage of advancement the work may be pushed.

In saying that dairy work might be *studied* as well as

taught in a school, I used the word *studied* pointedly and advisedly. The advantage of a properly organized school or college would not be by any means limited to *giving instruction*; indeed, the opportunity such an institution would afford to the scientific explorer for the thorough investigation of many subjects of which we have at present a mere shadow of knowledge, would be immense. It is only a few weeks ago that M. Pasteur, the great French chemist, visiting the laboratory I have established at Bayswater, said, "How I should like to spend a month here studying milk ferments!"

#### MILK FERMENTS.

We have not in England any scientific man of eminence devoting the whole of his time to dairy chemistry and dairy investigation. Pray understand me; I do not mean the "analysis of milk." We have many very talented men, members of the various chemical societies; but men of the class we find in Denmark, Sweden, Germany, Switzerland, Italy, and France—professors, really professors, I mean, "with a great big P," not professors in name only—do not give their attention to this subject, with us; at least, they have not hitherto done so, simply, I believe, because we have not a *habitat* for them—no soil in which they could flourish—no place in which, free from external or business influences, such men could work quietly, and pursue their investigations and observations, surrounded by all the necessary materials upon which to work.

Mr. Lister, F.R.S., Professor at King's College, author of "The Germ Theory of Fermentative Changes," and of "Lactic Fermentation and its Bearings on Pathology," has thrown considerable light upon the bacteria of milk, but his researches have been made, I believe, entirely with regard to pathological science. A few days ago I was reading an address delivered by Mr. Lister, "On the Nature of Fermentation," and I was much impressed with the results of one of the investigations therein described, and its possible connection with "the dairy." The object in view was the study of *Bacteria Lactis*, the particular form of organism which is the actual cause of what we know as lactic fermentation, or, in more simple language, the souring of milk. Mr. Lister's experiment was to ascertain whether, by preventing the development of *bacteria lactis*, milk would remain unaltered. He accordingly took means to prevent the development of these organisms; but all the samples of milk underwent fermentation, only of a different sort, the result of which was the development of other organisms, presenting tiny specks or granules, some orange, some yellow, some red, and others green; also two or three kinds of fungi. Mr. Lister came to the conclusion that these organisms declared themselves owing to the absence of *bacteria lactis*, which would under ordinary circumstances have been present, and would have smothered or killed these other species.

Now may not this throw some light upon the fungi or growth of various colours observable on many of the soft French cheeses, Camembert, Livarot, Brie, &c.? It is well known that the makers of these cheeses look with care and anxiety for the due development of the special shade of colour, upon which the sale of their product so greatly depends, and that these shades of colour should change in due order, as the ripening process proceeds. Why are these farmers so particular? Because the dealers in these descriptions of cheese demand that they shall be of a certain colour. Why do the dealers make this demand? Because it has been found that the best flavoured cheese is always of certain peculiar shades, and that therefore, by valuing the cheese by its colour, they are unconsciously attaching a value to a development of some particular organism, which development is dependent upon circumstances that permit this particular organism to flourish

and which are objectionable to the existence of any other organism. Lactic acid ceases to exist in cheese at a certain stage, and this permits these other organisms to come forth. The question therefore presents itself: Are these various organisms the cause or the effect? If the latter, their importance is not of great moment; but if the former, and both opinion and evidence are in favour of this view, then a great field is opened.

The researches of Pasteur, Lister, and other scientific investigators have proved that, by the introduction of certain germs into the human system, certain effects are caused, and by the prevention of the development of certain germs, other results are obtained. Pasteur has proved that various forms of bacteria *can* be cultivated. May we, therefore, not hope for results from future investigations that may exercise considerable influence upon some of our dairy processes? We have seen that the souring of cream is essential in butter-making. If this be so, it follows that there must be a degree of acidity, a certain development of lactic acid, that shall be better than any other degree. May not pure lactic ferment—that is to say, *bacteria lactis* free from other forms of bacteria—be obtainable, and in a form that can be added to sweet cream in an exact proportion, just as we add a carefully measured quantity of rennet to milk in the process of cheese-making? I go farther; if these wonderful organisms do exert the influence, and are the causes, of certain results, may it not be possible to produce, to grow in fact, the exact species that may be found to exert the desired influence in the ripening of cheese, &c., &c.? Duclaux, a French chemist, found in certain cheeses six different forms of ferments—organisms; and further, that one of these, the chain-vibrio, possessed the particular power of making the small particles of curd sticky, so that they more easily became consolidated into a close mass.

By drawing attention to this subject thus roughly and incidentally, I hope to reach the object I have in view, viz., to show how important a part influences comparatively unknown to us at present may, and indeed are playing in the world, and how important is the "infinitely little," and what a field for investigation and study is here open, not to mention the hundred and one other directions in which an earnest student would find congenial occupation. Now where could this be so well provided as in a *school*, with land, plants, and animals, at the beck and call of science?

I was amused to read the other day in an agricultural journal that "opinion is not by any means unanimous in favour of Mr. Allender's proposal to establish dairy schools in this country," then proceeding to quote "the adverse opinion." It may be that the gentleman who expressed that opinion is a much better authority than I am, and that he has given the question more thought and attention than I have, although I dare make a wager he never put foot in a continental dairy school in his life. But when he went on to say that all requirements of the case would be met by the establishment of a travelling dairy, from which lessons in butter-making should be given, I felt that he had yet something to learn. To teach a child to read and write is most right and proper, but to call that education, cannot be admitted.

If every dairy-maid in England made good butter instead of very bad, as many of them do, it would be an immense step in the right direction. If, however, the object had been only to teach people how to make butter decently, most certainly a dairy school was not needed. But I wanted to get just a little beyond that; and, notwithstanding this worthy person's ideas on the subject (perhaps he thinks, "where ignorance is bliss, 'tis folly to be wise"), I adhere to my opinion, and I do feel that it is a disgrace to us that we are willing to allow other countries to progress where we stand idly by. I not only hoped to have established a dairy school, but

that it should have been the *best* and the *most complete* in the world. Our position, soil, and climate are all admirably fitted for the attainment of this object; all we wanted was money.

There are gentlemen in this room who can bear me out in what I say. However, a live jackass is better than a dead lion, any day; so, *faute de mieux*, let us do what we can to instruct those who wish to learn how to make good butter. I'll do what I can towards it.

In conclusion, gentlemen, I say, with much regret, that I am fully aware that I have read you a long, dull, heavy paper; but I must ask you to pardon this, and make up for my shortcomings by a good discussion. I have given you plenty to talk about, as I know there is much to criticise in my remarks.

## VETERINARY DEPARTMENT.

*Under the direction of D McEachran, F. R. C. V. S., Principal of the Montreal Veterinary College, and inspector of Stock for the Canadian Government.*

### CLYDESDALE HORSES.

The interest which has been attached to the improvement of horse breeding in this province, and especially in the different breeds of heavy draught horses, induces us to believe that a short historical and descriptive account of these breeds may prove interesting to our readers.

The engraving which we give of a Clydesdale in this number is taken from Sidney's Book of the horse, and is an excellent representation of the stallion and mare of the breed.—They take their name from the valley of the River Clyde, in Lanarkshire, Scotland. The early history of the breed is traced by nearly all writers to six coach stallions, imported from Flanders towards the close of the seventeenth century, by the Duke of Hamilton. (1)

The correctness of this tradition is however strongly denied by a writer in the Paisley Advertiser, dated March 9th, 1827. This breed is not now confined to Lanarkshire or Clydesdale. In fact, the best Clydesdales are not bred in that county, but are to be found in nearly all the well cultivated counties in Scotland. It may be said, however, that it is only within the past thirty years that any special attention has been paid to the breeding of them, and even to-day it is impossible to get a pedigree, of a mare especially, for more than two or three generations; for the simple reason that, while the mares have always been selected to breed from, yet they have been selected for individual merits and points of excellence more than for pedigree, and even yet, a good individual mare, or horse, will command the highest price irrespective of pedigree.

Within the past thirty years, more attention has been paid to the selection of the stallion, but individual points invariably determined the selection; nor could it well be otherwise, where no register was kept, and where the introduction of foreign blood not only was not objected to, but was considered an advantage. It is a well known fact that some of the best Clyde-horses in Scotland, to-day, derive many of their good points from the blood of the English draught or Shire mares. (2)

It is also well known that some of the most noted breeders in Scotland are in the habit of importing shire-mares and crossing them with the best horses in the country, and in this way produce horses which in many respects are improvements on what may be considered as pure Clydesdales. If we compare the Clyde as described by Brown in 1830, with the same

(1) Gray in colour, generally, and, according to contemporary authors, much desired by ladies for their coaches. Hence the proverb: "The gray mare is the better horse." A. R. J. F.

(2) *Shire*.—As Bedfordshire, Leicestershire, as distinguished from Kent, Surrey, Sussex. A. R. J. F.

breed of the present day we shall better understand the transformation which new blood and better care have produced. He says, "The Clydesdale horse is lighter in body than the Suffolk Punch, and more elegantly formed in every respect, with an equal proportion of bone. His neck is also longer; his head of a finer form, and more corresponding to the bulk of the animal: he has a sparkling and animated eye, and evinces a greater degree of lively playfulness in his general manners than either the Cleveland or Suffolk horses. His limbs are clean, straight, sinewy: the head of this horse is firm and nimble: he is capable of great muscular exertion, and in a hilly country is extremely valuable; he is a very hardy animal, and can subsist on almost any kind of food.

The equanimity of his temper and steadiness of his movements particularly adapt him for the plough. Not being too unwieldy in his size he is no burden to the soil, while a pair are equal to the task of drawing a plough through a full furrow with great ease. The horses of Clydesdale are not only celebrated on account of their value for agricultural purposes, but are also adapted for the saddle and useful as carriage horses."

Few who are familiar with the Clydesdales of the present day would recognize the breed in the "fine head," "clean, straight, sinewy limbs" and his "adaptability for the saddle and carriage," in the animal above described. It is scarcely necessary to say that the fine head has given way to one of rather large if not heavy proportions as compared with the Percheron, although a small clean head is occasionally met with in some families, as, for instance, in the produce of the "Prince of Wales," and in their progeny. While the mare still retains the neck long and somewhat fine, as a rule, the stallion's neck is thick and the crest heavy. The length of body and legs ascribed to the breed by several authors has given way to remarkably short, strong, hairy legs, and to compact backs with wide chest and quarters. He still retains his light, free action, and is often found to trot with great speed, when his weight is considered, as stated in the Book of the Horse: "At a local show held some years ago on Clifton Downs, near Bristol, a Clydesdale stallion exhibited by the Duke of Beaufort, weighing nearly a ton, out-trotted all the hacks in the show in a course of a few hundred yards."

It will thus be seen that the Clydesdale horse of 1830 was a very different animal from the so-called Clydesdale of to-day. This change has been brought about, not by the importation of stallions of larger breeds, but by the importation of large shire mares, from England, which, being crossed with the hardy constitutioned, free actioned, Scotch horse, produced stallions retaining the good qualities of the native with the increase in size and shorter bodies of the English cart horse.

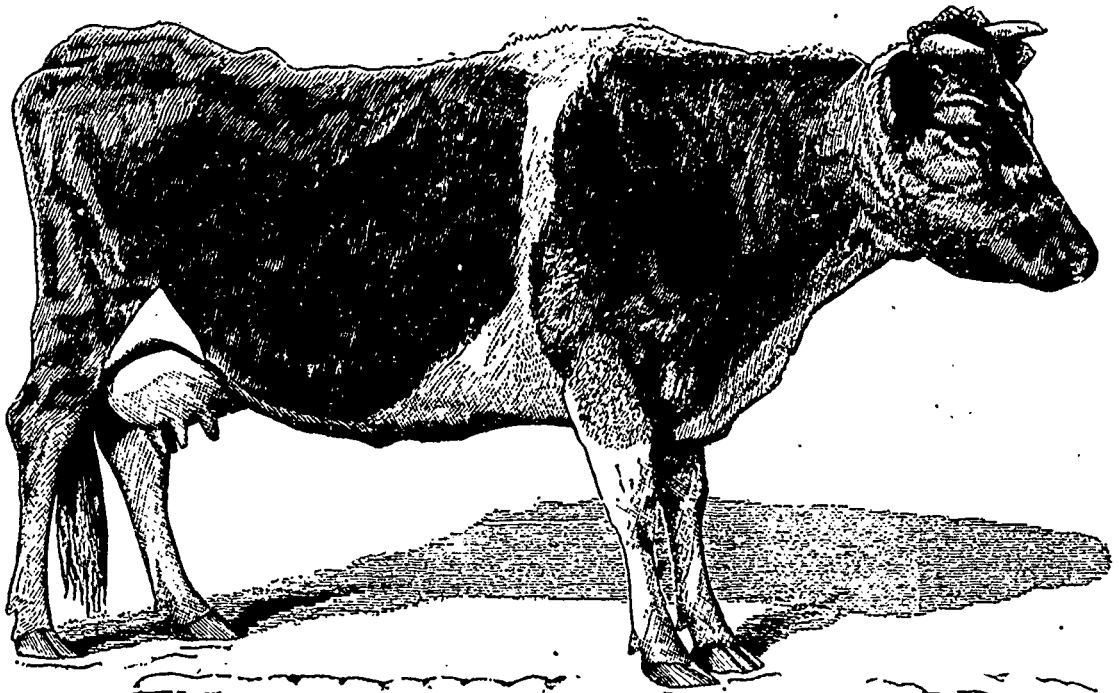
The Clydesdale of to-day may be described as a powerful draught horse, of a bay, brown, black, grey or chestnut colour, (excellent specimens of the breed are found in all of these colours) with a disposition to white, especially on the face and legs, usually about sixteen to sixteen and a half hands high, weighing from 1600 lbs. to 2200 lbs. The head proportionate to the size and weight of the body; usually well set on, sometimes long and often Roman nosed, with long hairs hanging from under the jaws, which are usually wide. The forehead is wide, and the eyes large and prominent. The neck is of medium length, and in the stallion, the crest is heavy. The back, in good specimens, is short, compact, and the barrel round and "well ribbed up." The withers high, but the shoulder thick. The chest broad and deep; the quarters wide; sometimes sloping and the tail set on low down compared with lighter breeds. The thighs are muscular, hooks large, legs straight and short, muscles of the thighs and fore arms well developed. The legs wide, flat, the tendons hard and clean; the legs covered by long fine hair, very thick

and long, from below the knee and hock, forming a large tuft at the fetlock and long and thick, round and overhanging the coronet. The feet medium, inclining to large, quality of horn good. The action usually high, bending the knee well and bringing the foot firmly down in the manner usually admired by horsemen. They are invariably intelligent and active, but with a spice of temper and determination of character that renders them invaluable in heavy draught. They will usually bring their load with them, unless something gives way. Jibbers are seldom met with in Clydes.

They are usually good feeders and readily fatten if well fed; are hardy and long-lived, sure breeders, and will produce an average of six foals per mare. The stallions are easily managed, and are sure foal getters. They readily accommodate themselves to any climate or circumstances, and no horses show a better return for extra care and food.

It will thus be seen that while many animals of comparatively little value are found in the stud-book of Clydes, many of the best bred-horses are not entered, and thus, under the existing state of affairs, the Clyde stud book is of hardly any value, as a guide for purchasers of Clydesdales in Scotland, and we have had some sorry illustrations of this fact in some worthless animals which have been imported into this Province, the only recommendation they possessed being their being registered in the stud-book.

It must not be inferred from this that we undervalue registration and pedigree: far from it. We regret exceedingly that the starting of this stud-book, which was very much needed, was not done more judiciously so as to include all the breeders, and prevent what is so much to be deplored, a division and want of co-operation, which are injurious to its success and usefulness—and, while we would recommend any



A JERSEY COW.

Within a few years, an abortive attempt has been made to start a stud book for Clyde horses in Scotland. From what has been explained above, it will be seen that, of necessity, many worthless pedigrees had to be admitted, and many of the best horses in Scotland were not eligible. The fact is, that two of the most extensive breeders and owners of Clydes in Scotland, who usually carry all before them in the showing for horses and mares of all ages, do not recognize the stud-book, as they do not believe that the breed is incapable of improvement, and they know, too, that many of the best horses in Scotland have shire blood in their veins, and although they own and breed large numbers of colts and fillies eligible for entry in the studbook, yet they do not enter them.

society or individual who propose to import Clydesdale horses to secure if possible horses registered, or eligible for registration, yet we would not advise them to reject a good animal of good pedigree even if he is not in the stud-book: many such are to be found in Scotland.

We would strongly recommend that a standard of pedigree of some kind be laid down by the committees of agricultural exhibitions, so as to avoid the disputes on this subject so common at both local and provincial shows.

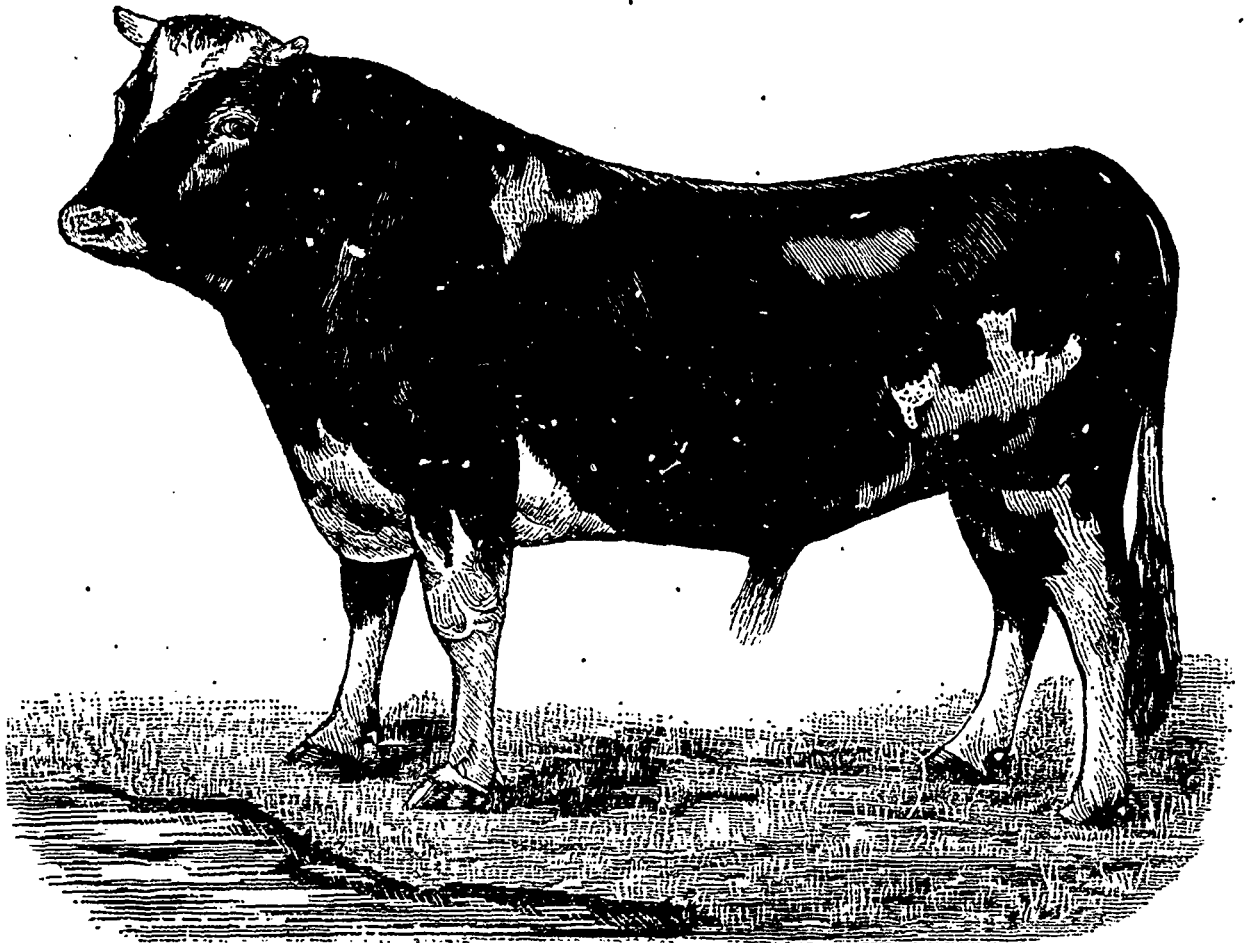
The value of Clyde blood as a cross with the Lower Canadian mares is now so well known that we need scarcely refer to it. The increase in size and in bone, without lessening their activity or hardiness, is well known to the carrying

companies of both Canada and the United States, and has created a demand for horses bred in this way such that our farmers cannot attempt to supply. a demand that is yearly increasing. The experience of the counties of Chateauguay and Huntingdon in breeding from Clydesdale stallions was, that the ready sale and large prices which they obtained for their horses made the farmers independent, and their experiments with thoroughbred and coaching horses for a few years seriously injured them; lessened the value of the horses, in these counties by many thousands of dollars; and, fortunately, led them to return to the Clydesdales, for which the district is once more justly famed.

We are daily accustomed to see horses bred in the above county sold in Montreal for \$200 and \$275 each; and we know that it has cost the farmer no more to bring them to market as four and five year-olds, than it costs to bring horses which sell for \$80 and \$100.

thirdly, I set one in a box with new hay and twenty two eggs, the result being that they all came out alive in twenty days, to which I have plenty of witnesses. The mother during her period of sitting only received the same attention and care as the other hens that were walking about, namely, fresh meat and clean water every morning. I have a few of the chickens alive, and promising to be strong, healthy birds.—I am, &c.,  
 JAMES JOHNSTON.

There is a good deal of truth in Mr. Thomson's letter on the management of poultry. His remarks, however are of a somewhat negative nature, and do not give much information on the subject. The inference one would draw from such a letter is, that to be really successful in poultry rearing, it is necessary, or all events desirable, to have a heated glass house. I am afraid that such a recommendation involves much trouble and expense. Indeed, this trouble is just the barrier to successful



GUERNSEY BULL.

## Poultry Department

### Letters on Poultry management.

Mr. Thomson writes that the hen that sets herself in the soil is much more successful than the one that gets a little of attention and care. I would like if Mr. Thomson would take notice that I, not as a practical poultry breeder, but more for fancy, have hatched a good few this present year in three different ways, viz., one in a box with straw and fifteen eggs set in hay loft, the result being nine out of the fifteen; the next being set on the bare soil with twelve eggs, the result being none out of the twelve set, all more or less partly formed; and

poultry-making. Thousands of farmers and others who keep poultry really know nothing about the management of them, and care less. They think, however, that it is necessary to keep poultry running about their farmyards, and leave them very much to their own resources, without care or attention, except what they get from the female members of the household, who are supposed to look after them, yet who often do not, the result being that at certain seasons they are half-starved, and at others surfeited with grain, the small number of eggs and expense than most people are inclined to give for such a laid by such poultry being out of all proportion to the number kept.

With your leave, I will endeavour to supplement Mr. Thomson's letter with a few hints as to their management, and will begin by saying that chickens reared in glass houses are nearly always weakly and delicate. Such places, however, may be sometimes judiciously used for hatching and rearing very early chickens in severe weather.

People who keep poultry generally err by keeping too many birds for the accommodation at their disposal, being actuated, no doubt, by a desire to make as much out of them as possible. It is well known, however, to those who have bestowed attention on this subject, that under certain conditions of house room, space, &c., the fewer hens that are kept in one place the better will they thrive and the more eggs will they produce. It is very difficult to get people to believe this, it looks so contradictory to common sense; but let anyone try it, and in the course of time report the result, and it will be found that it is a fact. Far too many birds are kept about our large farm steadings, all herding together, and it is because of the peculiar advantages in this respect of the numerous small holdings in France that the people there surpass us so much in rearing fine poultry, and in sending so many millions of eggs annually to this country. The same holds good to a smaller extent in Ireland. The remedy, therefore, is to get more people to take an interest in fowls, to get them to breed them, and to keep them separately in small numbers.

With regard to feeding, an error which most people make is to give their birds too much food, thinking that they will thereby increase the production of eggs as well as rear large, strong birds. As with the human family, the greatest eaters are often neither the largest, strongest, nor healthiest specimens. Indeed, to overfeed poultry generally stops the egg production, and causes an increase of internal fat, which always ends in disease of some sort or other, and birds unaccountably dropping down dead from their perches overnight. Two spare meals a day (one of them of grain) are all that adult birds require, although chickens in their early stages require to be fed much oftener. The safe rule, however, is to give no more at one time than will be greedily eaten up, and less harm will result from an occasional starving than from leaving meat lying about to get stale and sour.

There is often much bungling and ignorance displayed in the hatching of chickens in the rule of thumb system—or rather no system—with which it is gone about. The common way is to set hens as they become broody, with the result that in the course of time numbers of hens are going about attending to families of from one chick up to a dozen or more. Now, if hens, as they become broody, were kept up for a week, ten days, or even a fortnight, till a sufficiently large number were collected, to do all the hatching at once, what a saving of trouble and worry there would be! Then the chickens could be given in lots of a dozen or so to certain mothers, and those hens that are over, owing to some eggs not hatching, or to casualties at the hatching period, could be sent back to their runs to replenish the egg basket, which they would not otherwise do as long as they had chickens to look after.

Mr. Thomson speaks of nests with wooden floors, and points out some objection to them. Nothing, indeed, can be worse for either the hen-house itself or the nests than wooden floors. Dry earth is the best for both, and easiest kept clean.—From *The Farmer*. Eng.

#### Over-feeding of Poultry.

The revived discussion concerning the over-feeding of live stock—a discussion always cropping up periodically—has an almost equally important bearing upon the poultry yard, though in a somewhat different direction to what might have been the case years ago. Then, many birds grossly overfatted appeared in the pens at all leading shows, and exhibitors could have no reasonable probability of winning under half the judges, unless their birds were fed up as ducks are now, to the great danger of all their value as breeding-stock afterwards. The practice gradually came to an end through the remonstrances of exhibitors, who found that such birds would not "last," but speedily gave way under exhibition; and in that special sense it may be true that there is little occasion at present for any remarks upon the subject of this article.

But the subject has a bearing in another and a very important way, which we have been thinking for a long time it was time for poultry-breeders seriously to consider. We refer to the persistent "feeding for size," carried on for generations. It is well known to every fancier that the greatest size can only be obtained by frequent meals, and taking care to preserve the appetite by judicious change. Now the point is, that while this regimen does give the size, if well managed, it is by no means equally conducive to health. What should we expect of any race of men and women reared in that way? No one can have perused our columns since their commencement, without being somewhat struck by the evident increase amongst fowls of one form or another of *liver-disease*; and we cannot avoid the conclusion that the predisposing cause must be largely sought in the constant glutting of the appetite, often forced still more by the use of stimulating condiments. The past damp seasons may have something to do with it; but it can hardly be doubted that constant over-feeding has had far more.

And there is still another side to it. There are breeds justly termed "gigantic" among fowls, and they are some of the hardest known to the poultry-yard. But it seems probable, after the experience of many years, that even these have a kind of natural standard of size, beyond which nothing is really gained, while much is lost. Certain breeders are remarkable for the giants they show, but on close examination how very rarely is it found that these giants are models of symmetry? There are human giants, too, but we never dream of looking to them for even fairly-proportioned models of the human race, and they are seldom long-lived. It seems the same at a poultry show. Walk down any class of the larger breeds, and the fowls which exhibit the most vigorous health and exquisite symmetry are seldom identical with those which surpass in size.

Years and years ago, we wrote how, in breeding Brahmas, it was better every way to select perfectly formed stock of fair medium size than to select the largest. It is in the full medium stature we should all seek for the most perfect types of humanity—for the greatest perfection of either manly or female beauty. Through all creation, perfect *proportion*, or symmetry in every part—that is what gives alike health, beauty, strength, and productiveness. It is the true "standard," after all; and while we do not say that an increase in size is not a good thing, provided it brings no loss in this most essential point; and while there can be no doubt that generations of good feeding may, and sometimes do, somewhat increase the medium or standard size itself of a breed, we none the less feel that if the increase brings the least clumsiness, or fault in proportion, it is dearly bought, and brings other evils in its train. The strong tendency of modern poultry to succumb to liver-disease in wet weather, is a fact which should give breeders a serious warning. *Ex.*

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#### AGRICULTURE.

PARIS, DECEMBER 3 1881.

The question of pasture and meadow lands is assuming important proportions in France, and the recent work of M. Joulie has only added to the interest felt in the subject. It

is a fact officially stated, that in the regions where pasture lands abound, farming is more flourishing than elsewhere. In presence of such data, examination becomes a necessity. Connected with the matter is the rearing of stock, which also has largely increased of late, owing to the cost involved in the cultivation of wheat, the supplies of grain exported from other countries, and the assured demand for wheat in the home market. Many agriculturists have not hesitated to solve the question practically, by converting their land into meadows, or pasturages. M. de Gasparin has made a profound remark: many farmers are ruined in consequence of having too much land, but not one has ever come to misfortune by having too much meadow. In all good grass land, whether artificial or permanent, there must be a relative proportion between the graminaceous and leguminous plants. Taking as a base ten tons of hay, produced from such a mixture of plants, that eminent chemist M. Joulie, finds therein 376lbs. of nitrogen, 156lbs. of phosphoric acid, 211 of lime, 59 of magnesia, and 303 of potash; thus compared with other cultivated crops, it is not the most exhausting; with sugar beet, for example, which extracts the largest quantities of chemical substances from the soil—20 tons of sugar beet per acre, carry off from the soil 163lbs. of nitrogen and 136 of phosphoric acid, then follow many varieties of wheat which are also exhausting. Now, manurings are reserved for root and grain crops, grass land receiving none. How then does it arise that meadows retain their fertility? They become poorer, but do not disappear; the valuable grasses die out, and are succeeded by inferior kinds; it is then not so much the quantity of the return that is affected, as the quality. Further, meadows are generally established in the best soil, often in valleys, where the filtering waters bring down nutrition from the more elevated lands. In 2 cwt. of dry ordinary arable soil, there are: nitrogen,  $3\frac{1}{2}$  oz.; phosphoric acid,  $5\frac{1}{2}$ ; lime 17; magnesia,  $10\frac{1}{2}$ ; potash,  $8\frac{1}{2}$  ounces; taking the average depth of a cultivated soil at 8 inches, an acre would contain about 32 cwt. of nitrogen and the same quantity of phosphoric acid; the other chemical elements in proportion. There is here an enormous difference between what the soil has in store of chemical food and what vegetation exacts. An acre of beet requires as we have seen 163 lbs. of nitrogen, while the soil contains 32 cwt. of this element, or a sufficiency for 22 crops of beets. A like observation will apply to the other inorganic nutriment. M. Joulie explains this disproportion by the fact that each chemical element exist in the soil in two forms, assimilable and unassimilable. Did the soil contain all the food in the former state, it would be washed away and the land rapidly exhausted; existing in an insoluble or fixed form, the azote, phosphoric acid etc., yield only each year their treasures to vegetation in fractional quantities. M. Joulie draws a comparison between grazing and cutting meadows. He inclines to the former, because the animals find in the succulent, and above all, the young grasses, more nitrogenous matters, and of greater digestibility than when in the form of hay, where so much is woody matter passing through the system, without undergoing any transformation. Hence, why weight for weight of stock, pasture land will support a greater number of cattle, than if the crop was converted into hay. The chemist also avers that, in an economical point of view, the droppings of the animals restore immediately to the soil all the nutritive elements that the animal has not utilized, thus saving the labor of being converted into farm-yard manure. Chemically, all soils are not suited for grass culture, but they cannot the less be made so, by judiciously selecting the kinds of grass and clover most propitious; resorting to fossil phosphates, lime, marl, and fertilizers to supply richness. M. Joulie belongs to the school which believes in the atmosphere supplying azote to the

nutrition of plants. In the department of the Nièvre, the rearing of stock is the chief feature of agriculture, and the farmers have become immensely rich since half a century; meadows there are not permanent, and the land receives no other manuring than the droppings of the cattle; lime is added largely to stimulate clover, and when after eight years a meadow is broken up, oats are sown on the lea, then three grain crops, the fourth, oats along with clover and selected grass seeds; the meadows are never worn, and one head of cattle per acre is the ratio allowed. The stock are duly sent to the beet sugar grower of the North to be fattened. The general rotation in the Nièvre is eight or ten years grass, then oats, two wheat, and oats as above, but no manure is ever added to the soil; the soil is a sandy-clay and lets readily for 32 to 40 francs per acre.

Professor Kühn of Halle is occupied with the crossing of the cow with the Yak. There is nothing new to be demonstrated that animals of different species will breed; the evidence exists in the affirmative in the case of the goat and the sheep, of the hare and the rabbit. A cow, the product of a mother crossed by a yak, was covered by a short horn, and in turn produced a calf with all the traits of the yak at the tail and head. The products of these crossings however, are not fruitful between themselves, simply because they are hybrids and not crosses, the male of a hybrid is next to never so. Mules have been successfully crossed by asses and horses, but the same has not been the case with a male mule, although the researches of Balbini invite caution in this respect. (1)

There was a Gascon once who boasted that he gradually reduced the rations of his mare to a point where the animal lived upon nothing, only at this stage the mare died—which constituted a drawback. Discussions are taking place as to the practicability of diminishing the rations of horses in the cavalry or in the omnibuses, by employing maize-cake, beans, etc., in place of costly oats; or feeding the horses more highly, and by exacting more work from them, require fewer to feed. Professor Muntz lays down there is a point in the feeding of horses that cannot be overstepped; that high rations to one horse, will not produce a result of work equal to that produced by two moderately fed. In the case of the omnibus horses, the animals exceptionally over-worked, though well fed, are ever those first on the sick list.

In the conservation of green food, maize, clover, etc., in *siloes*, a fermentation ensues, of which the seat is the vegetable cell; carbonic acid, alcohol and acetic acid are produced at the expense of the immediate principles contained in the forage. Over 2 per cent of carbonic acid in the case of maize, and nearly  $1\frac{1}{2}$  per cent for clover, is given off during fermentation; if a part of the nutritive principles be lost, the remainder are made more utilizable. Also, the fatty matters are increased during the fermentation.

M. Deberain has repeated de Saussure's and Coreninder's experiments, that of testing the influence of carbonic acid on vegetation. But little of this acid is contained in the atmosphere: 10,000 quarts of it containing not more than 3 or 4; the professor placed haricots, colza, and tobacco plants under bell glasses, so as to exclude all communication with the external air; then pure carbonic acid, in measured daily quantities, was introduced. The beans and colza showed any excess of acid to be unnecessary, but the tobacco leaves became very plethoric, owing to immense deposit of starchy matter in the leaves. The experiment was controlled by kindred plants also placed under bell glasses, but supplied with common air. The tobacco leaves assimilated more carbon, than was supplied by the introduced acid: from whence did

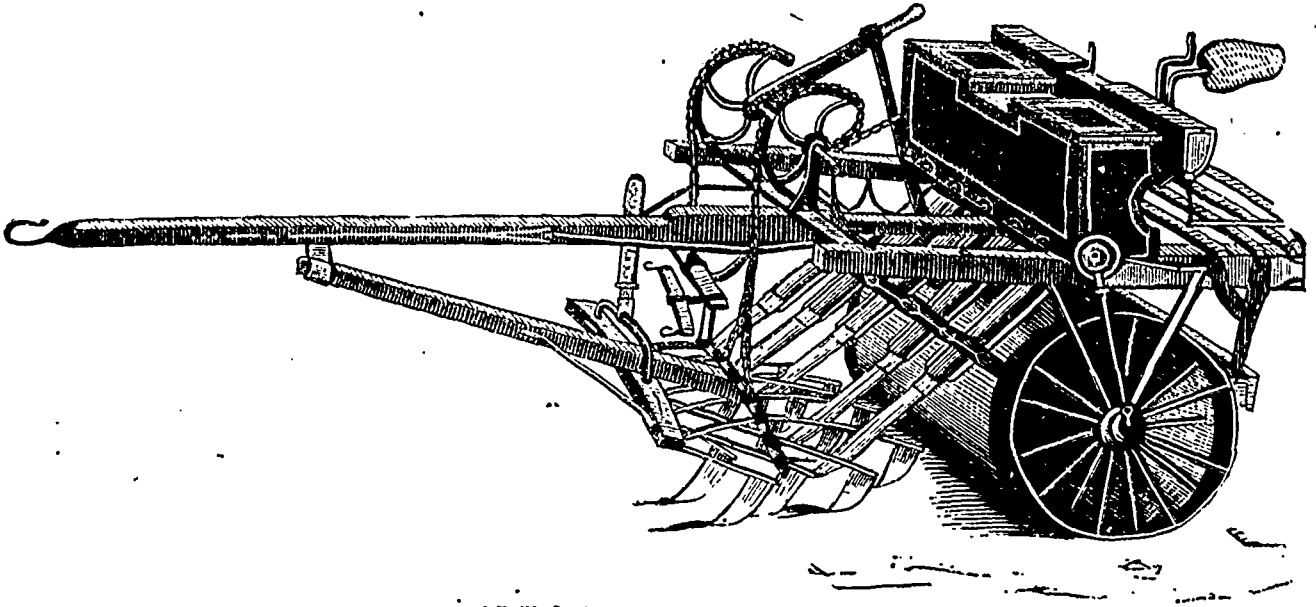
(1) The Yak is sometimes called "the grunting cow."



it come? From the disengaged oxygen, acting on the carbon in the soil contained in the pots, and thus producing additional carbonic acid.

Since 1847, Belgium has adopted the plan, and with best results, of decorating artizans and laborers with a medal, to be suspended from the coat button-hole. The idea is about being introduced in France. Indeed, humble distinctions

chain gearing, which connects a small wheel on the crank shaft of the engine with a large wheel on the crank shaft of the digging apparatus. The fork head runs in a slot in the side plates; and the depth at which the land is required to be dug is regulated in a very simple manner, as the side plates, which guide the fork head, hang, as above stated, from the crank shaft bearing, and can be easily swung backwards or forwards



Vessot's combined Drill, Roller, and Harrow.—MM. Côté & Vessot, Québec.

would be appreciated, more particularly if accompanied by a slender pension, or a donation to be paid at fixed intervals.

#### Our two chief engravings

This month, represent a Jersey cow and a Guernsey bull. The latter, judging from the expression of his left eye, has evidently just got the better of a rival.

The agricultural implements shall be explained in full next month: owing to press of matter, we have no room in this number to say more than that the drill of Mr Vessot is very popular in the neighbourhood of Joliette, Saint-Jacques l'Achigan, &c.

#### A new Steam Digging Machine.

Considering the depression in agriculture, and also in the varied interests by which that science is now surrounded, any improvement brought out to decrease the cost of cultivation cannot but be regarded with more than ordinary curiosity and interest, especially, too, when any such novelty is connected with the cultivation of the soil by steam power. It was therefore with no small degree of pleasure that we accepted an invitation to witness the first, and at the same time, a private, trial of a steam digger which has recently been patented by the inventors, Messrs. Carey and Crosby, and manufactured during the last two or three months by Messrs. Carey, Stilwell, and Birch, the well known steam-cultivating firm, at their works at Rochford. The apparatus consists of a plain flat iron frame, which can be fixed to the tender of any self-propelling engine. To this frame are bolted, or, rather, slung, the main side plates, between which two sets of twelve 18-in. forks (each set covering a width of five feet) are worked up and down by means of connecting rods attached to a crank shaft. The crank shaft runs in a bearing fixed on the tender of the engine, the power to work the digger being brought from the engine to the crank shaft by means of a detachable

by unscrewing a couple of bolts; so that the more vertical the plates are fixed the deeper the forks dig, and the more they are swung forward is the depth of digging decreased. When travelling along the highway they are of course simply suspended at such an angle as will clear the road. Upon the occasion of our witnessing the work of the machine last Thursday-afternoon, steam was "got up," and the engine and digger run from the Works into a field kindly placed at the disposal of the inventors by Mr. W. T. Meeson, and the simplicity and handiness of the digger were at once clearly apparent. The apparatus was attached to one of Messrs. John Fowler and Co.'s 8 h.p. locomotive engines, which appeared to have double the power required to work the digger; and the ease and satisfactory manner in which the work was done exceeded the most sanguine expectations of both the inventors, manufacturers, and those who had an opportunity of witnessing the trial. Among the advantages which Messrs. Carey and Crosby claim for their digger are that it can be attached to any ordinary self-moving engine and set to work without any loss of time, five minutes sufficing to get it to work after it is in the field, and similar time only being required to run it on the road after completing its work. On Thursday, although only doing 6 inch digging, it made very good work at between 50 and 60 revolutions per minute, and consumed the small quantity of two cwt. of coal per acre. Notwithstanding the rain fell during the whole of the time the trial took place, no trouble was occasioned by the engine sinking in the land, as is frequently the case with large steam ploughing engine in wet weather. Of course the engine used last Thursday was not built as the inventors intend to build them for the purposes of the apparatus, but, at our request, it was turned whilst at work with the result that it described a circle of only 27 feet diameter. With an engine constructed so that the front wheels "lock" right under the boiler it could no doubt be turned in its own length. The whole ma-

chine can be worked by the driver and the steersman; and we were informed that it can also be made on a frame similar to the steam cultivating implement frames at present in use, and can be hauled by wire rope. The total cost of making and attaching the "digger" to a traction engine—namely, £200—places it within the reach of any farmer of fair means, although with a specially constructed engine it would cost £600. Improvements will doubtless be made in the digger in the course of time; but Messrs. Carey and Crossby must certainly be congratulated upon the success their conjoint efforts have achieved.

**POTATO CULTURE.**

At the Birmingham show there were no less than fourteen classes of potatoes. Mr. John Perry, of Condover, Shrewsbury, won more than half the first prizes and several of the second ones, and probably no exhibitor on any previous occasion brought to competition so many splendid specimens. In



Broadcast hand-machine—Côté & Vessot, Québec.

fact, Mr. Perry's potatoes were quite the subject of general remark, and far more interest was excited in the matter as they had been grown by a special manure, to which Mr. Perry himself attributed the reason of his being so very successful, inasmuch as although he has been a frequent prize-winner at potato growing, and for a great many years has enjoyed a reputation for knowing how to grow good crops, he has never had such magnificent ones as in the present season. What then is the manure which has produced this notable result? We are informed that Mr. Perry applied the fertilising mixture recommended by the celebrated French chemist, M. Georges Ville, according to his formula No. 3 Normal manure, which has been translated into English by Mr. W. Crookes. The composition and price of this mixture is given as follows:—

	Pounds per acre.	Price.
		£. s. d.
Superphosphate of lime.....	352 ...	0 15 4
Nitrate of potash (Salpetre)..	264 ...	2 17 7
Sulphate of lime (plaster)...	264 ...	0 2 0
	880	3 14 11

**BUTTER.**

1. The cream should be removed from the milk before the latter has become sour. The reason for this is easily explained; as soon as the milk begins to turn, curd is produced, and it is then impossible to remove the cream without taking off some of the curd also. Curd means cheese, and if curd is made up with cream into butter, the latter must necessarily have a cheesy flavor, and will in a very short time become "strong" and very inferior in quality.

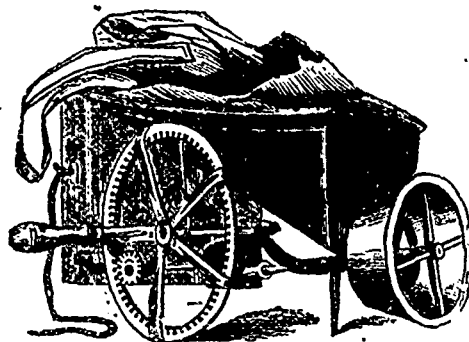
2. As soon as the butter makes its appearance, and while still in a granular state, the buttermilk should be run off. Plenty of cold water should then be thrown into the churn, and the butter washed by turning the churn a few turns; two or more lots of water should be used until the butter is thoroughly cleansed. Butter is frequently damaged by *over-churning*; it is quite an error to suppose that after butter once forms, more can be obtained by further churning; every revolution after the granules are about the size of Indian corn or small nuts, deteriorates the quality.

3. Butter should not be touched by hand. The water should be expelled by means of a butter worker.

**CORRESPONDENCE.**

To ARTHUR R JENNER FUST, Esq.

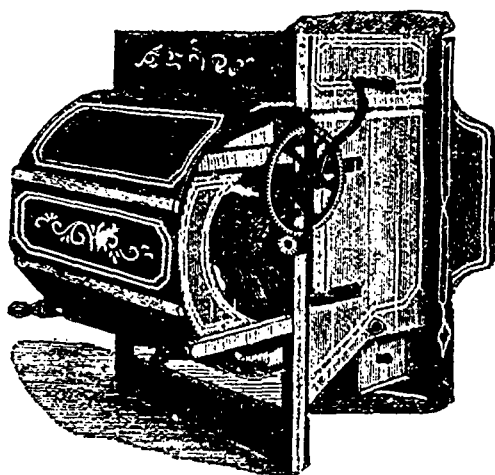
SIR,—I see a great many farmers are pulling up stakes and leaving Quebec and Ontario to settle in Manitoba. Farmers that have spent most of their life-time in clearing away the



Broadcast machine—Côté et Vessot, Québec.

bush, and have large farms, and good buildings on them, are now selling out every thing at a great sacrifice, and leaving comfortable homes. I very much doubt if they will ever have as comfortable homes again as those they are leaving. When I ask them what they are leaving for, they say that their farms are run out, they cannot grow sufficient to keep them, and they are every year getting more deeply into debt. This is their reason for leaving. Now, Sir, these are farmers that do not understand farming, and do not try to live by their farms; they do all their ploughing in the spring; they harrow in their seed in a very rough manner; they pay no attention to cutting and destroying weeds, but allow them to overrun their crops; as soon as harvest is over they sell all their hay and oats, some sell even their straw, and then they start off to the lumbermen to try to get a job of making a few logs or railroad ties; they do no fall ploughing; they cart out no manure on their farms; their barnyards are full of manure, even to rotting their buildings; and still they let it lie there and cry out: "my farm is run out and I have to leave it." Now, Sir, if these farmers had any interest in their farms, or had any desire to improve their farms, they would stop on their farms in the fall, and cart out all the manure they could possibly scrape up and spread it on their farms, and begin their fall ploughing immediately after harvest, so as to give the stubble and grass time to decay before the frost sets in, as every farmer should understand that when fall ploughing is done late or just before the frost sets in the stubble and grass will not decay, but will turn up quite fresh in the spring. A great many farmers never plough over four inches deep, year after year, and always the same depth, until they have a hard pan under the furrow, so that their plough will run on it as on a barn floor; they crop this four inches until

it is run out and will grow nothing, and still they have virgin soil below. If only ploughed up, to get the sun and air, it will renew the surface soil, and then it will yield a very fair crop without manure, but if it got a light manuring the yield would be double. Fall ploughing should be done from six to eight inches deep. After his fall ploughing is finished and all his root crop is in safe, he should not sit by the stove with his arms folded and the pipe in his mouth, and say 'my work is done, I have nothing to do.' Let him turn his attention to his cow houses, and see if they require any repairing, so as to have all the cattle comfortable with a dry-bedding under them. When cattle have that, half the feed will do them more good than a large quantity when they have not proper shelter, and no dry place to lie down in. Every farmer that has a few steers or dry cows should tie them in the stable and stall-feed them, instead of driving them away and selling them for half their value. Every farmer instead of selling all his produce and robbing his farm, let him stall feed it; and as soon as his cattle are good beef, he will see the butchers



Winnowing machine.—MM. Côté & Vessot, Québec.

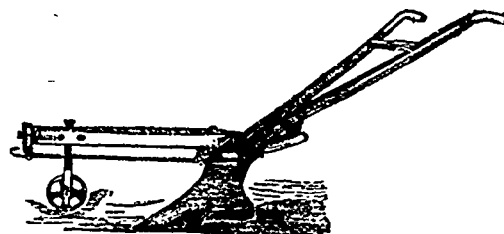
at his door looking to buy, with the cash in their hands ready to pay for them; and if they are good beef they will bring a high price. Every farmer should take this advice if he wants to become independent. Money is what makes every man independent, and good beef is money at any time.—Then he has the manure made from his own produce to put back on the land, to enrich it, instead of robbing it. Every farmer can find enough to do at home, instead of going to the bush to make logs or ties, if he attends to his stock properly, cuts his fire wood, and gets out his fence timber and timber for buildings he may require.—Then, in the spring, as soon as the snow begins to melt, he will see on the sunny side of his buildings and fences, where the cattle have been standing, there will be a large quantity of the droppings of the cattle during the winter and all round their watering place; this should all be gathered up before the snow is gone, as it is much easier to gather then than it is after.—This should be spread on the pile of manure, and all leached ashes, hen-dung, and every kind of manure that can be got or scraped together. This can be done before the spring work commences. As soon as all the crops are planted, he should clean out every building and barn yard, and cart all the manure and put it in a pile, and let it lie about two months, and then he should turn it all over, mixing it thoroughly together; then, after harvest, this will be in readiness to put over the land; if he does this, there is no danger of his farm running out, and he will soon be heard to say that his farm on the Gatineau is as good as any farm in Manitoba. Every farmer should have a tank, and

drain all the liquid manure from the yard and stables into it, and draw this out in the spring over his meadows, instead of letting it run off into the river or creeks, as this is a valuable manure for meadows, and will well repay for carting it out.

Yours very truly,

R. BOWDEN.

Victoria Farm, Wright.



Subsoil-plough.—MM. Côté & Vessot, Québec.

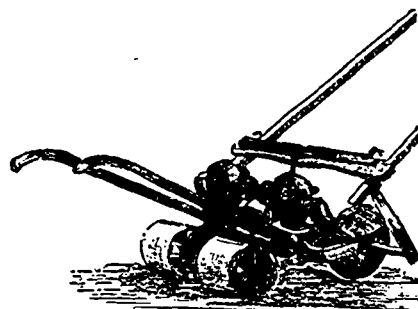
Sir, you strongly advise the tub washing of sheep, and I think you are quite right.

But, why wait until the beginning of June? Could not water be warmed to 65° F. in April, and the sheep penned in a warm or rather temperate well-boarded shed or *bergerie*, and shorn before the hot weather comes on? Waiting so late for shearing exhausts the sheep, and causes quite a loss in wool, which is dropped here and there.—Your opinion and remarks will oblige *Agricola*.

In the case of a small flock of 10 or 15 sheep, the plan proposed in *Agricola's* communication would answer perfectly. A good deal of warm water would be wanted, however, as the quantity carried off by each sheep in its wool is considerable.

If the sheep are in good condition, and the weather warm, I think, perhaps, 56° F. or 58° F. would be a safe temperature for the bath. Unhealthy or poor sheep may lose wool: I don't think there would be much loss with those in good order.

A. R. J. F.



Two-furrow turnip drill.—MM. Côté & Vessot, Québec.

Dear Sir,—According to promise, I send you an article on harvesting grain. It may be of interest to some—while to others it may not—but at all events, I hope to see a great many of our Canadian farmers begin to improve in their harvesting grain; because, to-day, I saw a farmer with some oat straw in his sleigh, and when I passed the remark to him, that the straw he had was not fit to be put under any animal for bedding, it was so musty; he replied that his cattle would be well off if they got all they could eat of it; when I told him, that it was no wonder that we saw so many miserable looking cattle in the farmers' yards in the spring after being fed all the winter on such, as I may call it, half-rotten straw.

I will begin first with harvesting wheat—wheat should be allowed to stand until it has its golden colour; then it should

be cut, tied up, put in stooks, and well *hatted* with two large sheaves, so as to keep the heat of the sun from the heads—if the heads are exposed to the sun after it is cut, the sudden change will cause the grain to shrivel up, and then the sample will be bad. (1) As soon as the straw is dry, the wheat should be carried to the barn as soon as possible. There is no need of leaving it in the field until the grain is dry and hard, it will dry in the mow, and the grain will remain plump.

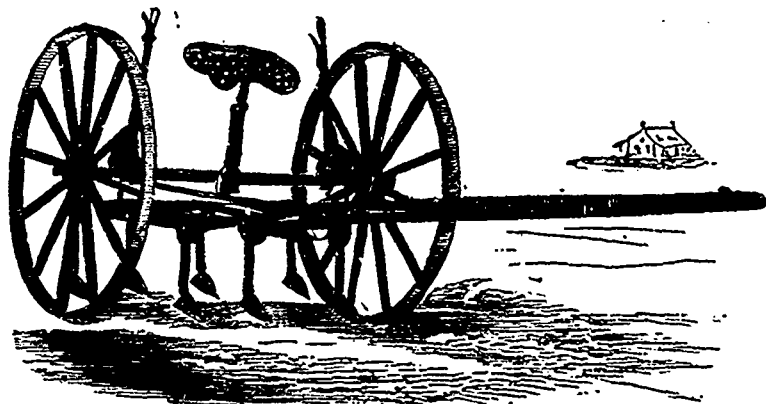
It has been said that wheat cannot be grown on the Gatineau with any success: now I must beg to differ, because, last spring, on the 20th of May, I sowed 6½ bushels of Fife wheat, and the return was 45 brls. flour no. 1. I never saw a better yield in England, and I very much doubt if it can be beat in any other country, and there are to-day thousands of acres on the Gatineau that are as well adapted for raising wheat as the Red River country, if properly cultivated.

Now I will make a few remarks on oats; this is a crop that a great many farmers do not understand when it is in a fit state to cut. Every practical farmer knows that oats will ripen in the stook nine days after they are cut, the same as they would if they were standing. Oats will fill and ripen as long as there is sap in the knots, it will take nine days before the sap in the knots will be dry, if it is cut when it is in a fit state. Oats begin to ripen on the top grains, and as soon as half the head is ripe they should be cut as soon as possible. At this stage a great deal of the straw will be green; so much the better. they should be tied in small sheaves, put up in stooks, and two large sheaves put over it to keep the hot sun from shining on the heads: if the hat sheaf is not put on the hot sun will cause the grain to shrink, and the sample will not be good.

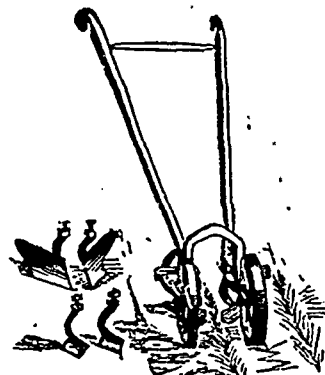
his cattle, as stock-raising is becoming more profitable, and I might add that the Gatineau is a very fine place for raising stock as there is abundance of pasture everywhere, and for water I think it has no equal. Stock-raising is already beginning to excite a great deal of interest on the Gatineau as there are several very fine Shorthorn cattle for stock-raising, most of them bought from Mr. Cochrane, of Compton. If the Gatineau makes as much progress in the next ten years as it has in the last it will be able to compete with Western Canada in grain and stock.

As for barley, there is but very little grown on the Gatineau at present, but I have no doubt the farmers will find it more profitable to grow barley than so much oats, now the lumbering is not so brisk as it used to be at one time. Oats and hay were all the farmers on the Gatineau cultivated, or tried to grow, but now they have to turn their attention to a more profitable way of farming, if they wish to become more independent.

When barley is sown, it should be covered all about the same depth, as much as possible, so as to have it ripen evenly; it should stand until it is thoroughly ripe (1), as it will not shake out in handling the same as other grain. When it is cut, it should be put in stook, not the same as oats or wheat, but three sheaves in the middle, then three on each side, 9 in a square . . . ; then put two sheaves on the top, both butts the same . . . way, and take a lock from both sheaves twisting them together so as to prevent them from falling off, then put one more sheaf at the top of these two in the open space, let the heads be sloping well down so as to carry off rain. Barley should be well protected from rain; if it gets much rain it will disco-



Grubber.—MM. Côté & Vessot, Québec.



Hand drill-hoe.—MM. Côté & Vessot, Québec.

The reason for cutting oats as above stated is this, if oats are allowed to stand until all the grains on the head are ripe, all the top grains, which are the best, will shake off in handling, and be left in the field, and the straw will be dry and have no nourishment left in it, but if cut as above stated, the sap will dry in the straw, and at the end of nine days you can carry them to the barn and they will be perfectly safe, and if a little salt is sprinkled over each load you will find when you thresh the oats that the straw will have a sweet smell, the same as well saved hay, and the cattle will eat it almost as well as they would hay. In fact I have seen our horses leave good hay and turn to eat the straw as soon as it was put under them for bedding. If every farmer would cut his oats as above stated he will find he will have a better sample and a better profit in every way. Every farmer should study his own interest, and endeavour to have good straw for

(1) Tome, A new, but I am inclined to think, a very just idea.

lour more than any other grain, and then it will not bring so high a price, as brewers require good, bright barley.

The crops on the Gatineau, last season, were remarkably good. Since the exhibition at the Pickanock has been held, I can see a marked improvement in the cultivation of farms. Farmers have taken a great deal more interest in their farms. Some very fine grain was shown: as good as I have seen in England.

Some stock were shown there that would have done credit to older settled parts of Canada. There was one Shorthorn bull, 4 years old, weighing 2400 lbs.; one heifer 4 years old 1740 lb., and one 3 years old 1400 lbs. The show of stock altogether was very fine.

If the Quebec government will only assist in building the railroad up the Gatineau, so as to be able to have a market within reach, the Gatineau will become as prosperous as any other part of the Dominion. I hope to see some of the Mont-

(1) If not, it will not grow equally in the couch. A. R. J. F.

real and Quebec gentlemen pay a visit to the Pickanock exhibition next fall, and judge for themselves.

I remain yours sincerely,  
RICHARD BOWDEN.

Wright.

#### Goëmon-biphosphaté.

The manure imported by the provincial government under this name arrived too late last spring to be of much service. The greater part of it is still in the hands of the Council of Agriculture, I believe, and can be had on application to the secretaries of the different agricultural associations at \$26 a ton.

From the analysis accompanying the manure it is evident that its principal value consists in the two substances, nitrogen and phosphoric acid, both of which are needed to perfect the growth of every crop on the farm. The experiments of Dr Lawes, so often referred to in the Journal, prove this satisfactorily. "To restore to the land the nitrogen and the phosphates removed by the crops we reap, is the advice of the theorist; and the practical man does not refuse to acknowledge its wisdom," is the opinion of Dumas the great chemist; and it is to our generation that it has been reserved to solve the difficult problem, how to preserve the equilibrium between consumption and production. I doubt if, in these, comparatively speaking, new soils of ours, any great want is yet felt of potash. At all events, a few bushels of ashes added to the goëmon-biphosphaté would amply supply the want; but I confess that, except perhaps for potatoes, I would not trouble myself about it; at all events the goëmon-biphosphaté contains a certain proportion of it.

The best way of applying the goëmon-biphosphaté, for grain, is to scatter it broad cast on the last ploughing, and harrow it well in when the seed is sown. If for turnips, I should sow it over the drills, and cover it by splitting them. In the case of corn or beets, to be planted on the flat, the same treatment as for grain may be pursued. (1)

The following quantities must be employed per acre, if we are to expect a good result:

For vines,	1900 lbs to	2240 lbs
Beets and sorghum,	1100 "	1300 "
Potatoes,	900 "	1100 "
Grain,	560 "	760 "
Meadows, &c.,	480 "	600 "

If the manure is in lumps, it should be pulverised by beating with a *rammer* on a hard floor, and afterwards passed through a fine sieve. Disappointment will attend any neglect of this most necessary operation.

#### Plums and Pears for the North.

Mr. Corse was the first who made (improved) plum growing a success in Canada. Between 1810 and 1830 he carried on a series of experiments, planting the stones of the best plums he could get, directly after taking them from the pulp. From the seedlings thus raised he selected those with large and thick leaves. Of Mr. Corse's seedlings, the Admiral and Nota Bene are the most hardy and productive dessert plums. The Admiral is large, very oval, dead blue in color, with a light bloom, flesh reddish yellow, firm, juicy, sweet and rich. It ripens early in September. Nota Bene is also a large, September plum, shaped somewhat like Green Gage, purple, with freckles and but little bloom, flesh reddish, soft, sweet and luscious. A late and very hardy plum of Corse's is the Sauvageon, of medium size, dark blue, firm flesh, moderately juicy, sweet and pleasant. The tree is a strong grower, long-lived and very productive, and as the fruit ripens in October and ships well, it is a very profitable sort.

(1) The manure must be harrowed in before sowing, of course.

The hardiest of all the Canada plums is a variety known as the Blue Orleans, which grows abundantly along the north shore of the St. Lawrence just below Quebec, and seems to do equally well on all sorts of soil. As a cooking fruit, it has decided merit, and may be shipped in barrels. There is also a yellow variety, otherwise similar. I think that from these plums, new, hardy sorts, good for dessert, might be produced, by hybridizing with sorts like Admiral and Nota Bene.

Almost as noted for his labors and success with the pear as Mr. Corse with the plum, was another Montreal pomologist, the late James H. Springle, whose essay on Pear-culture in the Province of Quebec, printed in the first report of the Montreal Horticultural Society (1876), is of great value. Mr. Springle tested every variety of pear that promised success in the Province, and his list of varieties with notes, embodied in the above-mentioned essay, is full of information. His death, in 1877, was greatly lamented among the fruit-growers of the province. I some time since, made an abstract from Mr. Springle's paper of the varieties succeeding in all respects best with him, and then compared them with the remarks of Downing, Thomas, and Barry, upon the same kinds. I did this with a view to a series of experiments in my own grounds with pears, starting upon the basis of Mr. Springle's tests in Montreal, and perhaps my memorandum will be of value to some of the readers of the FARMER who are trying to grow pears in hard spots. It is as follows, the list being from Springle, and the initials D., T., B., indicating the concurrence of the authorities above named.

#### LIST OF HADIEST GOOD PEARS.

Doyenne Boussock, D. T. B.  
St. Michael Archange, D. B.  
Doyenne Defais, D. T.  
Napoleon, D. T.  
Oswego Beurrée, D. T. B.  
Beurrée D'Anjou, D. T. B.  
Beurrée De Capiaumont, D. T.  
Howell, D. T. B.

To the list I would add, as among the hardiest I have already tested, St. Ghistam, Clapp's Favorite, Flemish Beauty and Onondaga; while in the northwest, Gansel's Bergamot (also recommended by Springle) has been found very hardy. Louise Bonne de Jersey, on pear roots, is also spoken of as successful far north, while some consider Duchesse D'Angoulême a very hardy pear. Here is quite a list to choose from, and I hope many of the readers of the FARMER in northern Maine will begin to experiment in pear culture. I have myself found a hardy seedling pear of fine quality growing in the vicinity, which I am testing as to other points of value (early bearing, etc.) and hope in time to give a favorable report. If the colder parts of New England and Canada can be made to produce even a home supply of good pears and plums, it will add greatly to the comforts and enjoyments of farm life, and tend to reconcile us to the severity of our long winters. As yet we have seen little cold weather here, to-day being warm and cloudy, with no sleighing so far.

T. H. H. From Maine Farmer.

#### Field Experiments at Cirencester.

Professor Scott, in his report at the close of the College term, says that the following conclusions are to be deduced from the field experiments which have been carried on this year at the Royal Agricultural College, Cirencester, Eng:—

##### UNMIXED MANURES ON GRASS PLOTS.

(a) The effects of nitrate of soda and of sulphate of ammonia were equal, and surpassed all the other manures used.

(b) Mineral superphosphate gave better results than did ground coprolite.

(c) The application of lime, both in the form of quicklime

and as gypsum, very largely increased the yield of grass over the produce of the unmanured plots.

UNMIXED MANURES ON ROOT CROPS.

On both the *mangel* and *turnip* plots.—

(a) The largest yield was obtained by the use of nitrate of soda.

(b) Ground coprolite gave better results than did mineral superphosphate.

On the *swede* plots.—

(a) Farmyard manure yielded best, dissolved bones second, and mineral superphosphate third.

(b) Ground coprolite had less effect than mineral superphosphate.

(c) On all the root crops—*mangel*, *turnip*, and *swede*—contrary to the results on the grass plots, the application of lime alone, either as quicklime or as gypsum, gave no increase whatever over the yield of the unmanured plots.

Sussex Cattle.

Captain Green's 1st prize steer, at 22 months old, weighed 1632 lbs. live weight! Probable carcass weight 65 o/o—1040 lbs. or 130 London stones; a quite unexampled weight, considering the age of the beast. When I first recollect the Sussex (1852), you might have buried your head behind the shoulder, but the improvement has been enormous, and their early maturity seems from all accounts to surpass that of all other breeds. They are red in colour, and not unlike strong, roomy Devons, which they now excel in every point, except in the rich yellow horn, a in certain charm of coat, and in gracefulness of carriage. A. R. J. F.

Mr. Morgan, a large shipper of cattle for the English market, says: "There is 50 o/o difference in the value of a common grade steer and that of a wellbred steer; in fact I would not ship a common bred animal, at all, if I could help it. It is of no use to send a poor animal to England.

I have shipped native stock. I did not find it profitable, even under the best circumstances. I would rather pay six cents a pound for a well-bred animal than four cents for a common animal of equal fatness. You require style and quality combined for the English market. The texture of the beef is better, the fat and lean are more mixed up, and the bone is smaller in a well-bred animal than in a common one." Ont. Ag. Commission.

Cotton Cake.

The following experiment by Voelcker on the relative feeding value of linseed cake, and cotton cake with maize meal, will be interesting to my readers just now, as cotton seed meal is to be had in Montreal for \$36 a ton. It will have to come

down in price, as it is absurd to pay the same price here for 2000 lbs. that the English people pay for 2240 lbs.

When 6 bullocks in two lots of three were put into the boxes on the 14th January 1880, they weighed:

	cwts.	qrs.	lbs.		cwts.	qrs.	lbs.
No. 1	9	2	2	No. 4	9	0	16
" 2	9	3	15	" 5	9	3	25
" 3	9	3	2	" 6	9	0	12

Total 29 0 19 Total 28 0 25

The bullocks were sold to the butcher on the 16th of March. In the 9 weeks the three beasts in lot No. 1 consumed:

	cwts.	qrs.	lbs.
Hay chaff	9	0	0
Wheat chaff	4	2	14
Mangolds	33	3	0
Cotton cake	13	0	0
Maize meal	13	0	0

The three bullocks in lot No. 2 consumed during the 9 weeks:

	cwts.	qrs.	lbs.
Hay chaff	9	0	0
Wheat chaff	4	2	14
Mangolds	33	3	0
Linseed cake	26	0	0

The increase, in live weight, of the linseed cake, bullocks was 3 cwts. 2 qrs. 9 lbs.; of the cotton cake and maize bullocks, 4 cwts. 1 qr. 15 lbs., i.e. the latter increased 90 lbs. more, in live weight than the former. On an average, each beast in the cotton-cake and maize lot increased 2.60 lbs. a day; and in the linseed cake lot 2.12 lbs. a day.

The cost of the cotton cake and maize meal eaten by the one lot was £10 9 8½; cost of the linseed cake eaten by the other lot £14 12 6. Difference of cost in favour of cotton cake and maize £4 2 9½, or about \$20.60.

This experiment is only one of many; the deduction Dr. Voelcker arrives at is: that in the successive years a mixture of equal parts of decorticated cotton-cake and maize-meal has produced a larger increase in live weight, and at a less cost than linseed cake. We now want experiments in the relative value of linseed cake and maize meal, as compared with cotton-cake and maize-meal. I hear that Parkyn's mill, Montreal, is about to be fitted up with machinery to crush cotton-seed. In that case we ought to get the cake at a reasonable price—say, \$28 a ton. A. R. J. F.

P. S. since writing the above, I see by the English market-reports, that linseed-cake is offered, of the best quality at £8 2 6 (\$40.00) a ton of 2240 lbs.!! Cotton seed-cake has, thus pulled the former down to a fair price.

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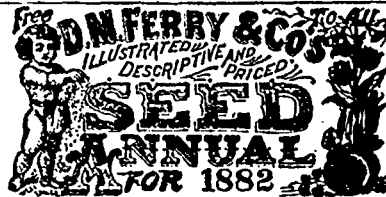
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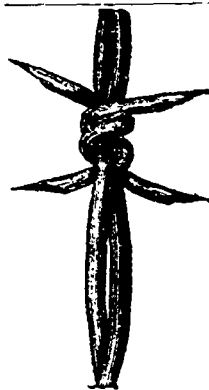
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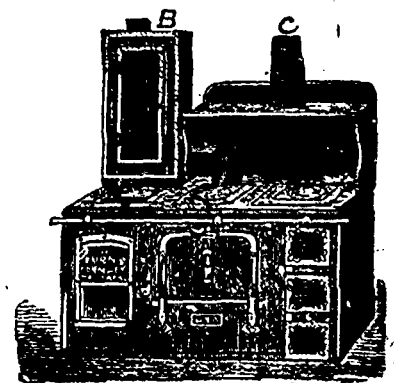
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