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# THE ILLUSTRATED JOURNAL OF AGRICULTURE

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198 30 5

STATEMENT of the number of Creameries and Cheese Factories in operation in the Province of Quebec, during the year 1881.

COUNTIES.	Cheese factories.	Creameries.	Combined.
Argenteuil.....	1	...	...
Bagot.....	11	...	1
Beauce.....	4	...	...
Beauharnois.....	...	...	...
Bellechasse.....	1	...	...
Berthier.....	6	...	...
Bonaventure.....	...	...	...
Brome.....	5	...	...
Chamby.....	2	5	...
Champlain.....	5	...	...
Charlevoix.....	...	...	...
Chateauguay.....	2	3	...
Chicoutimi & Saguenay.....	...	...	...
Compton.....	1	...	...
Deux-Montagnes.....	3	...	...
Dorchester.....	4	...	...
Drummond & Arthabaska.....	2	1	...
Gaspé.....	...	...	...
Hautecluse.....	...	...	...
Huntingdon.....	22	7	2
Derby.....	2	...	...
Jacques-Cartier.....	...	...	...
Joliette.....	2	...	...
Kamouraska.....	1	1	...
Laprairie.....	...	1	...
L'Assomption.....	...	1	...
Laval.....	...	...	...
Lévis.....	...	...	...
Leslides.....	4	...	...
Lotbinière.....	1	...	...
Maskinongé.....	6	...	...

In all : 198 cheese factories, 30 creameries and 5 combined butter and cheese factories : total, 233. A still greater number of establishments will be in operation from the month of May 1882 ; amongst them a school of instruction in butter-making at St. Marie, Beauce.

The two government instructors, Messrs. *J. M. Jocelyn* and *S. M. Barré*, will pass the season 1882 the former at the *school-factory at St. Denis, Kamouraska*, where the butter and-cheese combined system will be taught ; and the latter at the *school-factory at St. Marie, Beauce*, where instruction will be given in the art of butter making, and where the celebrated *centrifugal machine* will be in use.

Dept. of Agriculture and Public works.  
Quebec, 25th. April, 1882.

[Signed]

ERNEST GAGNON, Secretary.

### Ensilage in Canada.

EDITOR OF THE AMERICAN CULTIVATOR : Among the many interesting accounts of successful siloes, I do not remember to have seen any description of a silo in Canada, hence I took the more interest in visiting the extensive farm of George A. Pierce, of Stanstead, Province of Quebec, but a short distance from Derby Line, Vermont. Mr. Pierce is a full convert to the value and economy of ensilage for feeding cows, having erected and filled a silo last season. In answer to my inquiries concerning the new system, Mr. Pierce replied :

" I am deeply interested in the system of ensilage. I am its zealous advocate, and I am fully convinced of its correctness in principle and practice. It will be a pleasure for me to give you any information in my power on this subject for the benefit of my brother farmers."

This kindly greeting from Mr. Pierce is similar in its nature to that which I receive from every farmer who has built a silo. The pioneers in this great industry have not been humbugged by any one in this matter, they have no object to be gained in misrepresentation, they do not desire to influence other farmers against their interest or profit, but, as every experiment proves a success, the principle must be sound.

"What reason," I asked, "can you give for your belief in the principle of ensilage; what advantage is it to the farmer?"

"My idea is," replied Mr. Pierce, "that farmers want something that will enable them to get a larger return from a smaller territory than that they are now compelled to cultivate. They ought to obtain double the amount of production from a given area. If a farmer cannot avail himself of some advanced ideas and practices in this day of progress and competition, he must make up his mind to delve and slave himself, as he always has done, and get but small returns for his pains. I am confident that ensilage will be the sure remedy for these drawbacks to farming. I shall, therefore, turn a large portion of my tillage into pasture, and endeavor to live off a smaller area of cultivated land. I shall be able to double my stock, which is now 100 head. Again, ensilage has a succulent principle akin to that of grass, thereby making a food for cattle preëminently the best that can be secured the year round. I know scientific men speak disparagingly of it. They denounce it as a delusion in the same terms as the president of the Board of Agriculture of Vermont. I care not, however, for that. Practical experience tells me that their theory is the delusion, and our practice the reality. When I feed cows upon ensilage, and they favor me with the same results as when they are fed upon grass, giving the same quantity of milk, and just as rich; making just as good butter and producing as large an amount; keeping up the usual growth of flesh, and giving tone and vigor to the system, as indicated by the bright color of the hair,—which is really the putting on the 'finishing touch'—what is the inference?"

Mr. Pierce's practical arguments and facts were very convincing to me, and I requested him to state his own practice and experience in the matter, so that, through the medium of the press, his brother agriculturists might consider and draw their own conclusions.

"In the spring of 1881," continued Mr. Pierce, "I bought 1½ bushels of Mammoth seed corn and sowed three-fourths of a bushel on 2½ acres that I had richly prepared, putting on sixty loads of manure to the acre. I sowed the corn in drills, the kernels from six to eight inches apart, and allowed 2½ feet between the rows. This was planted that I might see what would be the production, and make use of it for Fall fodder. The first of September the corn looked splendidly. I felt certain I should secure twenty-five tons to the acre. On an average it was eleven feet high, some stalks running up to fourteen feet. Up to this time I had not dreamed of building a silo for myself, though I had read and heard much about ensilage. The mammoth growth of the corn suggested the idea of building a silo. Having never seen a silo I devised a plan for myself, and in ten days had my silo completed. I took one half of one end of my barn; made the cellar wall answer for one side of the silo, and the remaining sides I posted and boarded, then built up inside with one tier of brick laid in mortar. The bottom was made smooth, and the whole surface cemented. The barn has a basement, first, second and third floor. The silo extends to the second floor, and only a small portion rises above the surface of the earth around the barn. The air is, therefore, entirely excluded, and Jack Frost debarred from 'nipping

things in the bud.' Its size is 32x14, and fifteen feet deep, having a capacity of 200 tons. It is filled from the third floor by means of a spout. The door of the silo opens upon the second floor.

About the middle of September I began filling the silo. Two men were employed cutting the corn in the field, three teams drawing it to the barn, two men cutting it, up ¾ of an inch in length with an ensilage machine and two horses, each having a boy for a rider, and one man treading it down. I had a large amount of rowen that I put in with the corn which made about 150 tons of ensilage. After putting three or four inches of cut straw on the top, I covered the silo over, with planks, leaving them apart a little, that the air might be allowed to escape, and then weighted with stone, say about 150 pounds to the square foot. The 7th of December I opened the silo and found the condition of the ensilage almost perfect. When I gave it to my cattle they ate it as though they were perfectly satisfied. From that time to date, I have fed my cows and young stock one ration a day. They have never shown any disposition to reject it; on the contrary, they look for it with much impatience. They do well upon it, and they will bear the closest investigation without producing the least unfavorable opinion. I feed only hay and ensilage. To ascertain the effect of ensilage food upon milch cows, I put two to the test for ten days. At the commencement of the trial they were giving fourteen pounds of milk a day. At the expiration of the time they were giving twenty pounds a day, and apparently during the same time increased in flesh.

"Of course I was satisfied with my first trial. I feel elated with my success, so much so that I will now give you my programme for the coming season, and I shall carry it out in every particular, unless scientific men prove to me soon, in the face of my own practical experience, that I am crazed upon the subject of ensilage. I shall raise the height of my present silo to the third floor, giving it a depth of twenty-five feet. Opposite to this, which is the other half of the end of the barn, I shall construct in the same manner another of the same size as my present silo. I shall put a partition wall through the centre of both of these, thus making the two into four siloes. I mean to feed ensilage early and late, and this is the reason of my having several silos: I can open one at a time and in season. The capacity of the four will be 1000 tons. There is a track laid between the silos running the length of the barn on which is a car that carries the ensilage to the cattle, they occupying stables on either side. To fill the above siloes I shall plant this summer ten acres of corn in drills, five acres sown broadcast, and five acres of oats and barley. The corn sown broadcast and the grain are designed for filling one silo about the middle of June for early feeding. I have also thirty acres of clover that produces heavily. The assistance of the sun's rays will no longer be invoked to help make it into hay; it will be imprisoned with the June fodder. A second crop will be realized to go into the fall silo with the corn sown in drills."

## Poultry Department

### DIPHTHERIA.

An important title for a simple article in a periodical like ours, but a volume would be required to treat it fully. Besides, after having thoroughly investigated the subject, it is doubtful whether we shall arrive at any definite conclusion as to what remedies may prove efficacious in the treatment of this dire disease. Better instructed men than we have failed in the search; but, still, we will make the attempt, and, who knows but we may strike out something that will alleviate, if not absolutely put an end to the attacks of this terrible enemy of the poultry-yard.

Great service has been rendered to the henwife by our learned brother M. Meguin, and by his specifics; but in many places, diphtheria still continues its ravages, unperceived, frequently, by the very owners of the poultry whose ranks are being decimated. The best remedy, then, is to define the disease, and to point out its characteristics, its causes, and the different forms under which it shows itself. When once it is well understood, it will become less formidable, and it will be less difficult to apply a prophylactic, or a curative, treatment.

In spite of the assertions of many naturalists, we persist in finding an analogy between diphtheria among human beings and diphtheria among fowls. We find the same causes, the same symptoms, the same effects. And we are inclined to believe that the malady is transferable from the one to the other. Not that we mean to say that diphtheric animals are dangerous as food; but we would not allow a child to remain long in a place where there are many birds suffering under the complaint.

To prove the truth of our opinion, we will cite some passages taken at hazard from a lecture by M. Floris Bouffé, M. D. of Paris, and no one who has seen and attended fowls attacked by the disease can read the extracts without seeing at once that the phenomena observed in both cases are identical.

Definition: "Diphtheria, incomprehensible in its species, as inappreciable as the miasmatic poison of the marshy districts, whence springs the deadly ague, follows the same law as all epidemics, and, carried along by the circumambient air which we breathe, diffuses itself therein, and attacks the individual without difficulty. Then, in proportion to the aptitude of the subject and his condition of receptivity, finding a fit place for the incubation of the disease, it seizes upon it, develops itself, and betrays its presence, externally, by the formation of a false membrane, which is its first sign; while, in other cases, those who live in a very hotbed of infection are unaffected by it. We therefore adhere firmly to the opinion that diphtheria is a miasmatic poison."

Have we not often proved these facts in our yards? Why are certain subjects (1), certain breeds even, attacked, when others go entirely free? Why, in the same enclosure, are Crève-cœurs, La Flèches, Hamburgs, decimated by the epidemic, when the Brahmas mixing with them are for a long time uninjured. Nothing but the extraordinary vitality of the breed can account for this immunity; but we continue our extracts:

"M. Bouchut thinks that diphtheria is originally a local malady, and that it only becomes general a little later, by infecting the system with a putrid absorption, or blood-poisoning; causing the death of the patient by subsequent endocarditis and fibrous fungoid growth disseminated through the lungs and other organs."

Does it not often happen that our fowls, which after a little attention seem to be cured of their throat disease, end by dying from weakness; or, as in the next quotation, become dull and sulky, and without showing any sign of the complaint, die at the end of a few days, when the disease declares itself all at once and, as if spontaneously, over the whole system.

"What shall we say of those cases of undeveloped diphtheria, when the complaint is hardly perceptible, or appears in some unusual part. It seems to cause a sort of general disturbance, and the patient cannot succeed in 'throwing out' the disease. The doctor is consulted, probably, for something quite different, and it is only when convalescence is looked for that diphtheria breaks out."

(1) The Scotch gardener will still tell you that he has planted 20 subjects. The long friendship between Scotland and France, while England was at war with both, has caused the retention in North Britain of numerous technical words never heard in the South: *conf. pinch*, a crowbar, fr. *pince*; *tass*, a glass of spirits, fr. *tasse*, a cup; etc.

Have we not often seen the complaint appear under the form of a swelling of the eyes, and sometimes of the feet? In this case, it is not the local affection that requires attention, but the whole body. The analogy of the disease in both man and fowl is still more clearly shown in the next quotation:

"Washall continue, with most authors, to regard diphtheria as a general disease. We stated that it was not virulent; but it is contagious; and its tendency to attack the mucous membrane, and to exhibit itself in damp, cold seasons, induced us to reckon it among catarrhal complaints. In truth, it is a disease of that nature and the worst of them all."

"The causes which appear to influence the attacks of what is called miasmatic infection," says M. Chas. Robin, "are albumenoid matters in an altered state, whether animal or vegetable in origin. When they penetrate into the system, they induce, by degrees, modifications of the coagulable substances of the blood with which they mix."

Diphtheria, then, is a specific, infectious, catarrhal affection, principally characterised by the secretion of a false membrane. It permeates the entire system, and leaves traces of its attack on almost every member of the internal organization.

"Diphtheria," says M. Laboulbène, "is so truly an affection of the whole system that it works a profound change in the humours, and leaves behind it paralysis, a diseased state of the blood, and a bad habit of body, to which patients frequently succumb."

May we not, without altering a word apply these definitions to the disease in our poultry-yards?

We will now examine the different forms of human diphtheria.

*Mild form.*—Is pretty rare, and shows itself in the sporadic state. The patient, after a change of weather, is seized by a chill, a general uneasiness, with headache, and a sense of profound lassitude accompanied by feverish symptoms. The throat feels sore, but the action of swallowing is little, if at all, painful. The sub-maxillary glands are not invariably swollen, but sometimes with people of lymphatic or strumous habit this occurs. Upon examination of the throat, one of the tonsils will show a small whitish spot, which generally remains for three or four days and then disappears of its own accord.

This sort usually attacks animals after a long and tiring journey.

*Middle form.*—The general symptoms at first are not very severe, and it is only on a local inspection that a general redness of the throat is observed; the uvula is long and pendent; the tonsils slightly inflamed. The false membrane extends, in this case, its boundaries, although it does not usually travel beyond one of the tonsils. Sometimes the uvula and the pillars (whatever they may be—probably the side of the larynx Trans.) are the seat of a slight exudation.

*Typhoid form.*—Rather rare, and is only met with during certain epidemics, following a sort of chronic march. It is insidious in the highest degree, and demands energetic attention. Relations and patients alike are deceived as to the character of this type of sorethroat, which, however, differs very little from the others. Thus, instead of spreading rapidly so as to cover, in a few days, the whole throat, the false membranes show themselves on certain places, and disappearing suddenly, break out quickly again on the parts as yet spared. If the patient be five or six years old, he may resist the attack for a short time; but weary and depressed, he is generally carried off after a lapse of time, which has only given false hopes of his recovery. In fact, he suffers a long-drawn agony for eight, ten, or even twelve days, and dies at last, not from the extension of the false membrane over the larynx, but from diphtheric poisoning.

These descriptions should leave us no longer in doubt as to

the identity of the human and animal diphtheria. We will now follow M. Floris Bouffé in his analysis of the causes of diphtheria :

"First, the causes of diphtheria comprise those that act from without on the system, and, during epidemic seasons, predispose it to absorb the diphtheric miasmata floating in the air, and facilitate the development of the complaint in a soil thus prepared for its reception. Cold is the first cause. This is generally admitted by observers. Believing, as we do, that this is a catarrhal affection, what more natural than that it should rage in the cold season? thus, in autumn it begins its ascending curve, which grows more marked during the colder months, and gradually relaxes towards the end of spring and the arrival of summer. Damp seasons, also, favour outbreaks of diphtheria, as well as days of sudden elevations and depressions of the mercury. Low, damp places, are regular producers of the disease at all times of the year.

It is indubitable that cold is a predisposing cause of the malady, but diphtheria can exist in other than cold countries: Spain and Italy, Brazil and Cuba, have all suffered from its ravages. In these hot climates, the great volumes of dust may, and very probably do, irritate the throats of the inhabitants and render them predisposed to suffer from the disease.

If we have opposed the idea that cold countries alone suffer from diphtheria, it is because the argument will not hold if we consider those damp, warm countries which are situated between the tropics. There, the influence of moisture is indubitable. It is this, in our idea, that most powerfully favours diphtheria. Thus, on one side, we find cold climates offering many cases, especially in winter and rainy seasons; on the other, hot climates afford plenty of epidemics as murderous in their effects. So in this case the causes are twofold: 1st, the diphtheria which is observed in hot climates breaks out either in the midst of great heats, when the soil is soaked by rains of whose abundance Europeans have no idea. Under these conditions, the humidity being continuous, we observe that diphtheria, endemic there as in Paris, becomes epidemic."

All poultry-keepers have remarked the same thing, and can point to an aggravation of the disease both in great heats and in very damp weather. Animals attacked in the middle of summer are often the most difficult to cure. Have we not seen, too, a couple of years ago, after a long wet season, diphtheria raging and becoming epidemic throughout a whole department of France (we won't mention which, but all *amateurs* know very well its name), to that extent, that even in the best managed poultry-yards it was impossible to find one fowl free from the disease? When the weather resumed its usual behaviour, the epidemic sensibly diminished.

May not this coincidence of rainy seasons with outbreaks of diphtheria give rise to the opinion entertained by certain authors, that diphtheria is a sort of marsh-fever. It is not natural to suppose that some effect may be caused by the decomposition of vegetable albumenoids, which, rising into the air, may produce infection in the neighbourhood, and transmit the effect of blood-poisoning into the system through the pulmonary organs. The remark, whatever be its value, is the result of observation.

2nd. Among the causes of the second order, we will name poverty. "As regards diphtheria, as well as all other epidemics," says M. Ernest Besnier, "poverty, more than anything else, favours their development, and aggravates their attacks; no means exist for the suppression of these epidemics to be compared with an improved system of hygiene and proper food." (1)

"Another most powerful aid in the dissemination of these diseases, is the collection of too many children in a small,

(1) *Misère* means in French, semi-starvation, filthiness of surroundings, and a general wretchedness of life badly expressed by poverty.

badly ventilated space. As a last cause, we will mention *contagion* and *infection*: by the latter we mean, that sort of diphtheria which appears spontaneously and without a known, or appreciable, reason, and by *contagion* we mean, that which we see arise from contact with persons coming from infected places."

All these causes, especially poverty, bring the epidemic into our yards. It is not to be wondered at that when our poultry are kept in damp, dirty buildings, too confined in space, when their food is given in too small a quantity and thrown down on a filthy floor, when dirty water is offered them at irregular intervals—it is not to be wondered at, I say, if the poor birds suffer from any disease that may be prevalent. If all these things be removed, the chief causes of diphtheria will be removed too. It is thus that our own yard has been freed from its ravages, we have used all sorts of specifics, salicylic acid etc, but none of them ever arrested its progress. The best of them we find to be petroleum, used by inhalation, or as a gargle or throat-wash. It may sometimes even given, in very small doses, as a draught, but whatever remedy is applied care is the great preventive.

First of all, pay a visit, and not a hasty one, to your yards every morning. The moment any fowl looks ill, separate it from the rest. Apply your remedies at once, if you like, but above all place the patient in a warm, well-sheltered place, where the temperature can be kept up to at least from 50° F. to 60° F. Without a *constant* temperature, all your care will be thrown away. If the fowl be without appetite, it must be artificially fed with strengthening food, and sulphate of iron should be given in its water. A few drops of lemon-juice may be given twice a day with advantage. Citric acid will act in two ways: as a healing application to the sores in the throat, and as a general stimulant of the system. We leave the task of giving recipes for draughts and powders to those chemists who have made a study of the disease; but we recommend our readers to avoid those of a too complicated formula. (1)

From the French.

AVICOLTEUR.

#### Mr. Tegetmeier on the Management of Poultry.

Mr. Tegetmeier (whose rising was greeted with applause, to which one of his "living specimens" made a sufficiently vigorous contribution) explained that he should have preferred to at once enter upon the course of instruction he had mapped out, but had deferred to the desire of others, who thought a preliminary statement would be valuable. According to the syllabus, he was to deal first with the origin of domesticated fowls, the importance of which was hardly possible of exaggeration. The wild fowl, which was the origin of our domesticated varieties, had its nest—if nest it could be called—upon the ground, a slight hollow being scooped out for the reception of the eggs, which thus came in contact with the damp soil below, as well as with the warm breast of the hen above. If we would only act in accordance with these facts, we should have no difficulty in hatching eggs; but if we would persist in placing rows of pigeon-holes one above the other, in hard square boxes, into which we put coarse straw or (still worse) hay, we could not expect success, this mode being so different from that of Nature. Not only, under our system, were the eggs not cold underneath, but they were kept in the impure atmosphere of an overcrowded hen-house instead of in the fresh pure air the hen herself would select. It had been demonstrated by very recent scientific experiment that eggs, to be hatched successfully, must have

(1) In 1848, I took eleven chickens suffering from the *gapes*, ten I shut up in a box, and smoked them with my pipe, *usque ad deliquium*, until they fainted. They all recovered and did well: the eleventh died! I see the authorities now recommend inhalation of the fumes of *carbolic acid*.

A. R. J. F.

a different temperature below from that above. It was important, too, that the habits of the wild fowl should be carefully studied. In hen-houses fitted with rows of perches one above the other, the birds were always flying to the top one, impelled by the remains of their natural instinct to fly to the highest branches of the trees upon which they roost. As there was not room in a hen-house for a bird to fly, it was constantly coming down with a violent blow upon the floor, producing injury to the feet, which was the cause of half the disease known as "bumble-feet." He proposed further to give a general outline of the structure of fowls, for there could be no intelligent and really profitable poultry-keeping unless we knew something of the nature of the materials we had to deal with. Unless, for instance, we were acquainted with the structure and functions of the egg-producing organs it was impossible for us to treat the hen properly; and the consequences of injudicious treatment were various diseases and want of fertility. The chief evil here was that we were prone to fatten the fowl to so great an extent that the functions of these organs were seriously interfered with. Then, again, it was essential to success in poultry keeping that we should understand the skeleton of the fowl. Of course the bird which almost exclusively used its legs for motion, and which could fly scarcely at all, had largely developed muscles of the legs and correspondingly small muscles of the wings; in other words, if we wanted a fowl with a good breast—i.e., a fowl specially suitable for the table—we must select one which was accustomed to fly. Having illustrated this point by skeletons of a Dorking-Game and a Dorking Brahma, the lecturer went on to speak of the production of eggs; and as a striking instance of the variation of fertility in different breeds, remarked that there was a well-known fighting bird in India, the hen of which laid only six or seven eggs during the season. That would certainly not be a very profitable breed for this country, especially as the cockerels persisted in fighting one another until only one was left. (Laughter.)

In the Spanish bird the instinct to incubate was almost entirely overcome, and she went on laying almost incessantly except during the moulting time. On the other hand, the incubating tendency in the Brahma was very highly developed, although the cultivation of feathers on the legs, which was so much thought of by the fancy, could not but be prejudicial. Adverting next to the management of the sitting hen, Mr. Tegetmeier drew attention to a coop, the object of which is to make the process of hatching correspond as nearly as possible to that of the hen in its wild state; the contrivance, the bottom of which is formed of wirework, being intended to be placed on the damp ground. A wild hen, he proceeded, would hatch almost as many chickens as she had eggs, instead of a paltry four or five out of a dozen. As to the management and food of chickens, many persons imagined that it was in the highest degree ridiculous to feed young chickens upon custard, and yet they were in the habit of giving them eggs and bread and milk, which, together, contained the elements of which custard was made. Custard, he had always maintained, was the very best food that could possibly be given to chickens, containing as it did the chief nutritive qualities that were needed, and being greedily consumed by the birds. In the course of the lectures, he should have to direct attention to the superiority of whole to broken grain. The former was the food upon which the fowl subsisted in a state of nature, and the moment the seed was crushed, it was, so to speak, disorganised and killed; the nutritive matter and the oil were exposed to the influences of the air, and the seed immediately became rancid. He recollected that when a boy, it was the almost invariable custom of farmers' wives, as soon as chickens were hatched, to violently open their beaks and thrust three or four whole pepper-corns

down their throats. Apart from the unsuitability of such a diet, there was the fact that a chicken required no food whatever for twenty-four hours after being hatched, for when the egg opened the yolk passed into the intestinal canal and became the creature's first food. We were all familiar enough with gape-worms, but very little was known of the history of these parasites. What became of them when the chicken died no one knew for certain. His own theory—it was only a theory—was that they passed into the bodies of worms or of some small molluscous animal inhabiting the soil, for it had been observed that the disease appeared in the same hen-yard year after year, but if the eggs were taken only a short distance away and hatched, no further trouble was experienced. It was not generally known, perhaps, that the process of artificial hatching, with which also he should have to deal, was by no means a new one. It was said to have been in practice among the Egyptians from time immemorial.

He held in his hand a book written by a celebrated French naturalist, named De Réaumur, and published 130 years ago.

It treated the subject of artificial incubation at great length, and there was a remarkable similarity between some of the contrivances noticed therein and those which had recently sprung up amongst us. In the processes noticed in this work, the heat was produced chiefly by the agency of manure. The matter remained in abeyance for a good many years; but some forty or fifty years ago, a Mr. Cantelo wrote a pamphlet—a copy of which (one of the few extant) was now before him—advocating incubation by means of hot water. He might mention, by-the-way, that he well remembered the poultry-farm which this Mr. Cantelo established at Turnham Green, and which, although it showed an enormous yearly profit on paper, landed him in a dismal failure, as was the wont of such institutions. Since Mr. Cantelo's time, the art of incubation had been greatly improved, and, indeed, had been brought to a high pitch of perfection. The incubator of his friend Mr. Boyle was admirable from a scientific point of view, but was almost too delicate for general use.

The great evil to be guarded against was the accidental raising of the temperature, which was fatal to incubation, and this danger was successfully obviated by Hearson's Champion Incubator, a specimen of which was now in front of him. Speaking of the eggs which came from France, the lecturer mentioned that Mr. Sutherland, who had travelled in that country to collect evidence for the Agricultural Interests Commission, had been unable to meet with or hear of a single poultry farm. There was a common impression in England that in France such farms abounded; but the fact was that the eggs were produced on the small farms of the peasantry, who made this but an incident of their occupation. Another erroneous notion was that eggs which were to be incubated must be handled very tenderly and carefully. As a matter of fact, the structure of the egg was so beautiful, and the mechanism by which the yolk was suspended in the middle of the white was so exquisitely perfect, that agitation wrought no injury. Thus it was that eggs after coming across the Channel were as well adapted to incubation as those which came straight from our own farmyards.—*Eng. Live Stock Journal.*

#### The American Association for the advancement of Science.

A meeting of this celebrated society will be held in Montreal during the last week of August. At the same time, and at the same place, the American Forestry Association will meet, and between the two a most instructive week may be spent by any one who desires to know how far knowledge has advanced in these progressive days. I sincerely hope this

visit may be the begining of a new state of things, as regards science, in Montreal.

ARTHUR R. JENNER FUST.

**Dissolved and undissolved Phosphate.**

Lord Tweeddale's experiments on these two manures will be in the memory of my readers. In 1880, at Yester, the crop of turnips from the soluble phosphates was 50 p.c. greater than the crop from the simply finely ground phosphates. This year the difference is more striking still. The experiment was repeated, and the following is the result :

	Undissolved per acre.		Dissolved per acre.	
	Tons	cwts.	Tons	cwts.
Bone meal.....	1	10	10	12
Ground coprolites.....	1	18	12	8
Ground curaçoa phosphate....		14	12	2.
Average.....	1	7½	11	14

The crop, even with the dissolved phosphate, was but a poor one, but the season was very unfavourable. The trial, however, of the two years cannot but settle the question as regards the soil of Yester, at all events. The plots were ½ an acre each, and the soluble and insoluble phosphates were applied on alternate ridges in the middle of a turnip field whose soil was fairly uniform. The amount of phosphoric acid applied was, in each case, 80 lbs. per acre.

At the Highland Society experimental stations, at Harelaw and Pumpherston, a very great and important result has been arrived at. In the oat crop, the dissolved phosphates increased (1881) the bulk of grain about 8½ bushels per acre, which is an increase of nearly 25 p. c., and at Harelaw 11½ bushels per acre or 17 p. c. Thus :

	Pumpherston.		bush. weight per bush.	
Average produce of undissolved phosphates plots per acre.....	34.2	42.8		
Average produce of dissolved phosphates plots per acre.....	42.7	43.7		
In favour of dissolved phosphates.....	8.5	.9		
Harelaw.				
Average produce of undissolved phosphates plots per acre.....	66.75	42.75		
Average produce of dissolved phosphates plots per acre.....	78.25	44.00		
In favour of dissolved phosphates.....	11.50	1.25		

So, not only in bulk, but in weight per bushel, does the dissolved phosphate hold its own, and this is an important fact, for in consequence of this two fold superiority, there is an increase in the weight of heavy grain at Pumpherston of 392 lbs. per acre, and at Harelaw of 560 lbs. per acre ; in other words, taking the average weight of oats at 40 lbs. per bushel, the increase of the dissolved phosphates over the undissolved is in one case 9.8 bushels, and in the other 14 bushels per acre.

Again, every one knows that a most desirable quality in a manure is the amount of grain it produces in proportion to the straw. Here, too, the manufactured scientific article beats the retrogressive one :

**Proportion of straw to grain.**

For 1 cwt. of straw there was produced of grain.

	At Pumpherston.		At Harelaw.	
	Undissolved	Dissolved	Undissolved	Dissolved
Bone ash.	52.3	64.5	74.7	102.1
Coprolites.	51.5	68.5	67.1	101.8
Bone meal.	68.3	73.5	95.5	107.4

Phosphatic Guano.	67.5	71.2	91	87.8
(1) Mineral phosphates.	70.8	75.7	96	103
Average...	62.1	70.7	86.9	100.4

At Pumpherston the increase of the proportion of grain to straw is nearly 14 p. c., at Harelaw it is 15½ p. c., and at this latter station it would have been nearly 20 p. c. but for the great falling off on plot 8, where a very insoluble form of nitrogenous manure had been employed at the commencement of the rotation, four years previously.

The increase in the proportion of grain to straw has a very important meaning. Not only does it mean the production of a crop which is in itself more valuable, but it means also that the time of the filling of the ears has set in earlier, and that the crop has arrived sooner at maturity, thus confirming the observation frequently made at the Highland Society's stations, that one marked effect of the use of dissolved phosphates is to hasten the time of ripening, and to advance the harvest by from 10 to 14 days. (2)

The upshot of these experiments is this : the unmanured plot 27 produces 13½ bushels per acre, showing that the land is really in an exhausted state and fit for trials. The next lowest yield is plot 22, where potash is applied yearly; the produce is only 14½ bushels per acre of which the extra bushel may or may not be due to the potash. Number 12 has bone ash every season, and yields three bushels more than the unmanured plot. The two manures potash and bone ash together give only 18½ bushels, phosphates a shade more only, but when nitrogen, in the form of nitrate of soda is given, the grain jumps at once to 34 bushels per acre. Lastly, when the whole are combined into one well-balanced manure containing phosphates, potash and nitrogen, the highest results in grain and straw are reached.

A. R. J. F.

A very large Silver Medal has been awarded to the Montreal Horticultural Society for their noble contribution of fruit to the exhibition of the American Pomological Association, at Boston. I know how much pains the Committee and Secretary of the Montreal society took about their exhibits, and I congratulate them heartily on the success of their efforts to show their country in a favourable light abroad.

A. R. J. F.

**OUR ENGRAVINGS.**

Jersey bull.—This lovely medium-size bull is the most perfect double of the Sultan of Mr. Ed A. Barnard's herd at Varennes. Curious, the hollow back in both of the Channel islands breed ! Tail set on a little too high, but head charming.

Clydesdale stallion.—A useful example of a useful breed.

Oxford ram.—Good enough, but head and legs a little too dark. A profitable breed of sheep, but the type, I should say, hardly fixed enough for crossing purposes. They only date from 1838. (3.)

Holstein cow.—Not knowing anything about the breed, except from hearsay, I will merely mention that the English breeders pay no attention, as yet, to the milk mirror, which this cow is putting herself to great inconvenience to display.

A subscriber to the *French Journal* is anxious to know whether sheep are profitable stock or not. A large subject to enter upon, but I will try and answer the enquiry briefly, though I am afraid I must dogmatise considerably in so doing.

(1) The ground undissolved Apatite seems to be thrown aside altogether : there is no mention of it, anywhere, this year. These mineral phosphates, then, do not include Apatite.

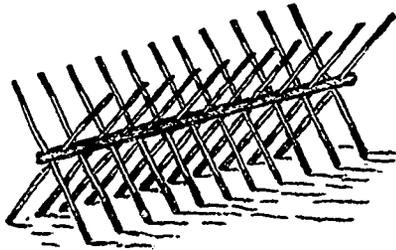
(2) A most important fact, if settled ! E. A. B.

(3) See Dr. McEachran's article on Percherons in this number p. 28. It takes a long time to fix a type fit for crossing.

Sheep have made the farming of Britain what it is. They have rendered possible the cultivation of millions of acres that without them would have remained a desert. But, you must observe, that sheep want care and attention. It is not to be supposed that turning half a score of ewes out, to wander about and pick up a living where they can, dropping their invaluable manure under the trees or fences, where no plants useful to man grows, is the way to keep sheep with a view to profit. Useful they may be, treated in this way; profitable they can't be to their proper power. We take account here of the value of the wool and lamb produced by each ewe, say \$5, and we are satisfied; never reflecting that each sheep voids 1,200 pounds of liquid and solid manure per annum, and would, if we would let it, do more good than all the rollers that we (don't) use with its little pointed feet on the ploughed ground. I am sure of what I say, when I state that a flock of sheep properly fed and looked after would produce a clear addition to a hundred acre farm of from \$200 to \$300 dollars a year, in less than 2 years from the starting of the flock. To make sheep pay as they should pay a regular succession of crops must be sown for them, and those crops must be fed off on the land they grow on, that no food may be wasted, and that all the manure may be deposited in places where it will be easily interred by the plough.

The crops are as follows: Tares, or vetches; rape; and, perhaps a few swedes; but I recommend the rape and tares as requiring no hoeing. If these are sown in succession, say every fortnight from early May, there will be uninterrupted food for sheep from the 20th of June until the middle of November: it takes a hard frost to hurt rape. It is impossible to say how many sheep an acre will carry, but if the land be well done by, and the assistance of a little corn or pease be afforded, 10 acres should support 60 sheep for the five months, and such a crop of grain will follow, bar accidents, as has rarely been seen in this province, since the time we are told of, when the Chambly country used to yield 30 to 40 bushels of wheat to the acre.

The following sketch of a hurdle has already appeared in this Journal, but I repeat it in connection with this subject; it is easily made and easily moved, two rows extending across the field will be wanted, to keep the sheep in their proper place; when the earliest break is fed off, it might be ploughed and Hungarian grass sown, which would afford a pleasant change of food. The sheep



should run the rough hills, if there are any, or the stubbles, from 9 o'clock in the morning, and come into fold in the afternoon about 3 o'clock. If sheep with empty bellies are put into wet rape they will probably get blown.

The most profitable sheep to keep? To answer this question I must take the figures of Mr. Brown, Agricultural College, Guelph. What I want to show is, that the Down-crosses are very much more profitable than the long-wool crosses. Is there anything more repulsive to the eye than a great lubber of a long-wool sheep, with wads of fat in lumps, hanging in a butcher's shop in hot weather?

	Carcass.	Wool.	Cost.	Balance.
	\$ c.	\$ c.	\$ c.	\$ c.
Southdown grade.....	10 20	2 40	6 00	6 60
Shropshire grade.....	9 90	3 42	7 00	6 32
Oxford grade.....	10 62	2 80	7 40	6 02

Merino grade.....	7 25	2 94	5 50	4 69
Leicester grade.....	9 90	2 24	8 10	4 04
Grade sheep of the country.....	7 50	1 25	5 00	3 75
Cotswold grade.....	9 95	2 52	9 30	3 17

Mean..... 4 95

By which we learn that, as I have always held, the Cotswold is the poorest mutton, and the worst money maker, of all the improved breeds of sheep, except in the natural habitat of the animal, the piercingly cold farms of the Cotswold Hills.

The column headed "cost" includes all food, ewe's keep during nursing, dipping, washing, shearing, proportion of ram's service, attendance, from birth up to the age of 15 months.

ARTHUR R. JENNER FUST.

### NELSON AND BEACONSFIELD.

Now, there are two illustrious names! But, unfortunately, the reason of their quotation is but a poor one: the Beaconsfield vine.

Mr. John Nelson, jr., has thought fit to address a short letter to me, in *The Illustrated Journal of Agriculture*, in answer to an article of mine, in the *Journal d'Agriculture Illustré* of last March, entitled *Viticulture*. To that letter the following is my reply:

1. Mr. Nelson shows a great want of delicacy in attacking me in the journal in question about an article published in French in another periodical, which the greater part of those who read his letter do not see. As a gentleman, my behaviour to Mr. Nelson would have been very different.

2. I accept Messrs. Bush, Sons, and Meissner as authorities on the subject, and as I suspect Mr. Nelson of only skimming over their work, I recommend him to read it again, carefully. He will see, at page 41, col. 2, that Messrs. Bush say that they do not know the *Champion*, but they intend to try it, to see what it is worth.

3. I advise Mr. Nelson to re-peruse the same page, when he will find that, as far back as 1875, frauds connected with the *Champion* had arisen.

4. Mr. Nelson will see, if he will study more deeply the most recent writings of his authority, Messrs. Bush, that after having spoken, in 1875, of the *Champion* without any experience of it, they speak, in 1882, with a thorough knowledge of the matter, and, now, place the *Champion* or *Talman* in the same class as the Hartford etc. as simply *early*, and not *extra early*, as it was supposed to be in 1878.

5. I am delighted to see by Mr. Nelson's letter that he admits, as necessary to his plea, that the *Champion* and the *Beaconsfield* are the same vine: a thing that has always been strongly denied by the proprietor of the pretended *Beaconsfield*. If Mr. Nelson is not amply furnished with delicacy, his naiveté is beyond dispute.

In conclusion, I request Mr. Nelson to say if he reads the authority he quotes in good faith. If he replies in the affirmative, I can only advise him to take lessons in critical reading. If, on the other hand, he says no! I reply that in that case he is only continuing the imposition of which the public has been the victim in regard to the false *Beaconsfield*; an imposition which Messrs. Bush, Sons, and Meissner, the authorities quoted by Mr. Nelson, state had already begun in 1875.

(Translated from the French.)

J. C. CHAPUIS.

### The Ash-leaved Maple again.

We intend both planting and sowing Ash-leaved Maples at once. The Hon. Mr. Joly began his experiments last year, as will be seen by his letter, which we append. The

subject is one of great importance, and we hope that any of our readers who have had experience in the growth of this really astonishing tree will have the goodness to help us to enlighten our subscribers on the subject. All communication on this question will be received with thanks.

E. BARNARD, Esq., D. A.

*My Dear Sir*—I regret that you were not able to publish my letter on the *Erable à Giguières* in the last number of the *Journal d'Agriculture Illustré*. I fear a year will be lost before the cultivation of that tree will be begun; still, the seed may be sown at any time in May. I have just witnessed the rapidity with which this tree grows. Last Autumn, I sowed, side by side, the seed of our *Canadian maple* and the seed of the *Erable à Giguidres*. Yesterday, I remarked that some of the latter had come up; some of them were an inch high, while the maple of Canada, as yet, gave no signs of vegetation.

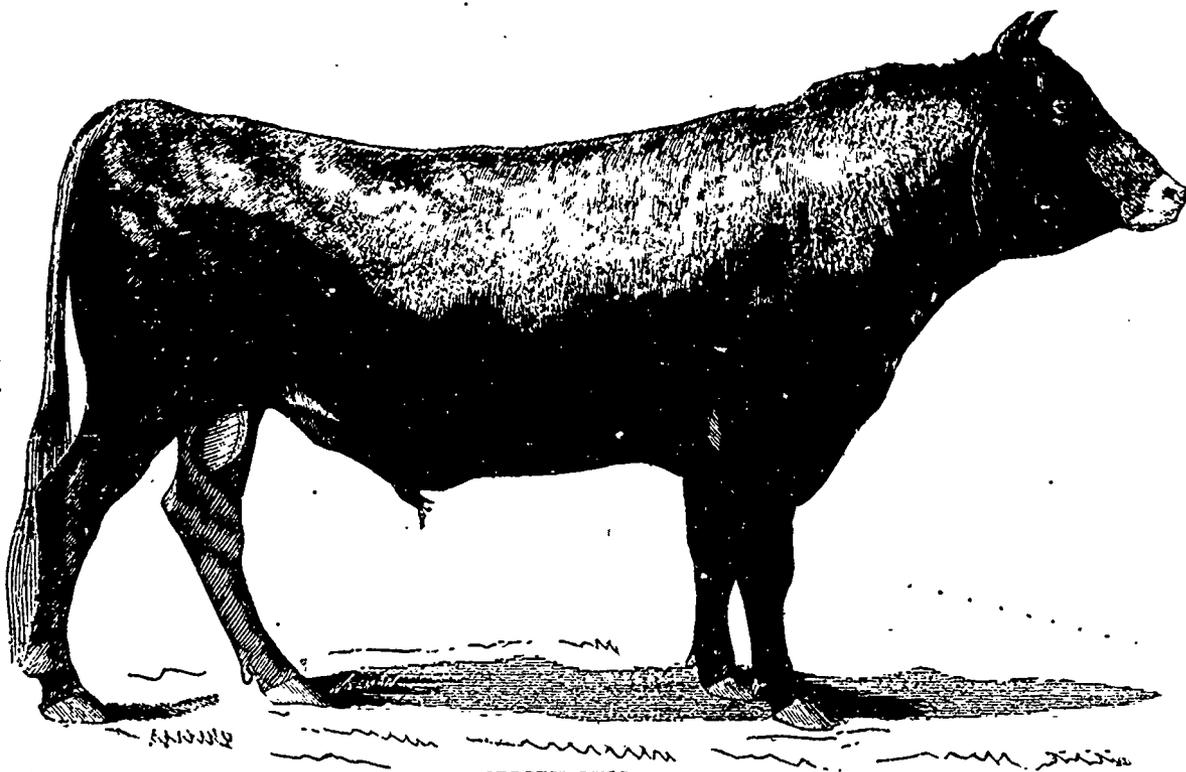
Very truly yours,

H. G. JOY.

P. S.—Mr. Brissette has lately sent me a bottle of *syrup*, made from the sap of an *Erable à Giguières* only five years old: the syrup was delicious.

implement makers have so been taught by the foreigner, that Jack is now as good as his master. French makers are actually bringing out novelties. A great many orders were taken both for implements and fertilizers, which would indicate good times with cultivators.

The judges have been unanimously condemned for awarding the prize of honor to an ox, whose race it would be difficult to establish. Hitherto, blue ribbons were awarded for symmetry and precocity: on the present occasion deformity and long efforts to arrive at the fatting point, have been honored. The animal selected for the supreme reward, did not possess a single point of excellence. Its fat seems to have been laid on in lumps, and suggested the appearance of an ox on the point of bursting after large ration. green food and water. The beast weighed 17 cwt. 73 lbs., and was aged 54 months; while there were fifty animals, of most correct form, representing nearly the same weight, but 22 months



JERSEY BULL.

## AGRICULTURE.

PARIS, FEBRUARY 25.

The annual fat cattle show of this city was, on the whole satisfactory, though I have seen superior exhibitions. There has been no sensible increase in the entries, save for sheep, and the number of choice animals in any class was very limited. This exhibition is organised by the government, and indicates something like a sad lack of practical judgment. It is the aim of all good farming to fatten stock within the shortest possible time: in a word to encourage precocity. The judges have simply ignored this end, in the case of the oxen at all events, to which I shall presently allude. Marked progress was evident in the case of butter and cheese: the French have felt, that the Danes were cutting them out in the butter markets of the world: hence, the new effort. The display of cheese was very remarkable; it is a branch of industry becoming every day more developed. The show of machines testify that native

younger. Thus, one young ox, aged 32 months, and weighing 17 cwt. 66 lbs. and beautifully formed, produces almost the same quantity of flesh, as the *laureate* in 54 months. In 960 days the former animal put up flesh at the rate of 30 ounces a day, while the second required 1661 days to put on 19 ounces daily. Ordinarily, oxen under three years of age, and having four fifths of Durham blood, fat at the rate of 28 ounces daily. It costs one-fourth more to produce one pound of meat in France than in England.

At the end of May, the sugar manufacturers intend to hold a Congress, where, among other matters, will be discussed the comparative value of beet pulp by the two processes for extracting the juice and refining the latter. In the mean time the sugar beet growers have met and exchanged views as to the best means for cultivating the root, etc. In point of practical utility, the Congress was very remarkable. What are the most favorable conditions for the culture of sugar beet? Deep tillage, in order to have roots, uniform and not



HOLSTERN OGW.

forky ; abundant manurings ; but manures easily absorbed and not rich in nitrogen, for excess of nitrogen produces roots poor in sugar and difficult to be worked up ; sow as early as possible, when frosts are no longer to be feared, and the soil has been dried after the winter ; select good seed ; no supplemental manures during the growth of the plant, as such develop the bulb at the expence of the sugar ; above all, no stripping of leaves during summer and autumn. Eleven roots to the square yard are considered fair spacing, and it is better to have the rows rather distant, and the plants rather close. Good seed is essential, and to obtain such, the bulbs for bearing ought to be selected under normal conditions of growth, and analysed to test their richness and purity of price, for it is possible by special conditions of culture, to produce a bulb exceptionally rich in saccharine matter, without the root being able to transmit that quality hereditarily ; further, such culture might produce an unbranching root, yet the next generation would display all the forkiness.

Beet extracts a great deal of potash from the soil, so the necessity of restoring that salt is urged upon the attention of growers. A deficiency of potash in the soil induces a premature falling of leaves, holes in the neck of the root, and a resumption of vegetation in September, which revival takes place at the expence of the sugar-cells. Phosphates are excellent, and the more so if wheat be intended to follow the beet. Some recommend applications of magnesia. Respecting the period of sowing : in cold regions, early sowing is to be recommended, while in warmer districts, the plant is held to resist the heat in proportion to its youthfulness. It was ever a knotty point, what ought to determine the monetary value of beet, for till lately, it was the only agricultural product where quality was ignored ? To test the industrial value of the root, was not less an essential factor in price than determining the weight. Two methods were proposed, estimating the density of the juice—and that is now generally employed—and analysing its richness, a process abandoned as being laborious and unreliable, although the densimetric standard has also its drawbacks.

The question of pulp did not raise serious discussion, as practical stock fatteners corroborated the scientists : when the pulp is to aqueous, correct the defect by dry rations in increased proportions. The sugar interest of France has two grievances : the inland duties and foreign importations. It is proposed to double the tax on the bounty sugars of Russia, Austria and Germany, and reduce the tax on the consumptive home product still farther. As to levying the other inland impost on the beet-root, as in Germany, instead of, as at present, on the raw sugar in the factory, it was agreed to leave that subject as it is.

Since June last Mr. Pasteur has vaccinated 90,000 head of stock, among which were 10,000 oxen, cows, and horses. In every instance his process was successful. the animals vaccinated escaped the *charbon* malady, while those non-vaccinated fell victims to that plague. Mr. Pasteur, and others have corroborated his view, lays down, that the effects of his preservative vaccine do not last longer than eight months, so that vaccination must be repeated annually, and that April is the best month for executing the operation.

Perhaps there is no city in the world where so much is made out of the soil in its vicinity, as Paris, its early kitchen garden delicacies are proverbial there are veritable fields of asparagus, peas, strawberries, and violets. Of fruits I say nothing, only that they abound. Of late years the cultivation of violets has taken an enormous extension, as also of figs in pots. Nice and Parma violets have more than a rival at present in the rich market-gardeners of the suburbs. It is not less singular than true, that the inhabitants of the

suburbs have to obtain their vegetables purchased in the city markets. From 1,500 to 2,000 fr. per acre, is it the net average produce of a kitchen garden. The commercial cultivation of flowers is also becoming very productive, and as for mushrooms, they are a veritable "gold diggings." France alone consumes the essulent to the value of nine millions francs per year.

Mr. Naudat, of Langres, has brought out a simple hand-threshing, or corn shelling machine, which works from 50 to 70 sheaves per hour, and that can be adapted alike to wheat, barley, oats, clover, etc. It is a want supplied to the small farmers of the East of France.

The irrigation of vineyards, in autumn, is universally recognised as efficacious against the phylloxera. Some proprietors now resort to summer irrigations, and small doses of sulpho-carbonate. At best, such can be but a check, as water is an insecticide, and in summer it augments the vigor of the vine, by causing it to throw out fresh rootlets : but no process can so far place the vine beyond the reach of re-invasions of the insect, under the form of swarms and the hatching of its winter eggs.

Cocoa-nut cake is being tried for feeding purposes : the analysis of Petermann shows that it is rich (20 p. c) in nitrogenous substances.

The reports respecting winter crops are satisfactory : no complaints are made respecting wheat, which bears up well. Indeed farmers are here so contented, that their attention is chiefly given to agitations for the suppression of several small and vexatious taxes, the making of good roads, and the reduction of railway transport rates.

*Dear Sir.*—There is a wide difference in opinion among cheesemakers as to which is the best process for making Cheddar cheese. The one side contends that it is preferable to draw off the whey from the curd while perfectly sweet, and make the cheese after what is called the 'non acid-process' ; and the other side is equally confident that it is right to leave the whey on the curd until the acid develops : that is the acid process.

Much has been said on this question, and I beg the indulgence of the readers of the Journal while I call attention to what I consider the right system.

The old proverb, "Truth lies between two extremes," was never more applicable than in this matter.

The peculiar sweet, nutty flavour of the finest cheese is caused by the presence of the light flavouring oils that are to be found in the herbs or grasses that the cows feed on, and these oils are more easily destroyed by the action of acids than the heavier fats, such as oleine, margarine, etc.

Consequently, when the curd is left in the whey until sour, it is impossible to produce a full flavoured cheese, because the flavoring is destroyed ; but still the cheese might show rich and solid when tried. On the other hand, if the whey be drawn off before the curd is sufficiently hard to enable the maker to keep it stirred loose and apart, it will mat together and the proper aeration is impossible ; especially if there be any bad odours in the milk, and the danger to the cheese is greater than when left in the whey for the acid to develop, because the cheese made after the acid process is only not very good, while the other is often positively very bad, owing to a lack of proper aeration while making.

If the curd is kept carefully in motion in the whey until it is hard enough that when a handful of it is pressed firmly together in the hand, upon opening the hand it will all easily fall apart, the whey may then be drawn off, and the curd be kept agitated sufficiently to prevent its packing together (taking care at the same time that the temperature of the curd does not get below 80°, until it will draw fine on

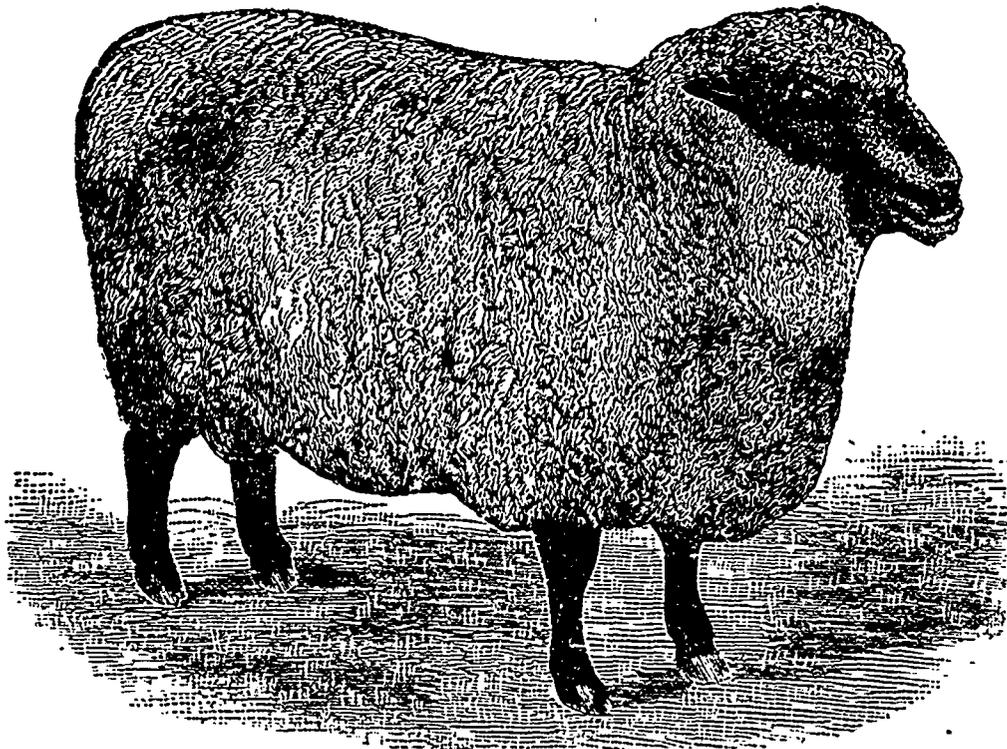
the hot iron about half an inch long. Then it may be salted and put to press, and thus far, the flavour is neither destroyed by too much acid, nor has the still more important process of aeration been neglected.

Again I say keep the curing room cool; for heat will destroy the flavour of cheese just as surely and quickly as it will of butter.

J. M. JOCELYN.

This is equal to the keep of one cow for  $4\frac{1}{2}$  years on  $2\frac{1}{2}$  acres of land!!

Mr. Bailey, the great authority on ensilage, holds with me, that though in the process of drying green grass or other forage 70 p. c. out of the 80 p. c. of water it contains is evaporated, something that is not water goes with it. If not, as I have often asked, why does grass make yellow butter and hay white butter? If hay loses nothing but water in the



OXFORD RAM.

### ENSILAGE.

There are no half measures in the States. When they undertake a thing, the inhabitants of that country go at it heart and soul; and in many instances, they overdo it. Ensilage, however, is not one of the things they seem likely to carry too far. It is not a new system, though it is generally supposed to be; for as far back as 1835, the French in Algeria discovered that it was the usage of that country, and, when at a loss for forage, hunted out the filled trenches, and made use of their contents for the cavalry. In Asia, on the Khivan mountains, Captain Burnaby found that the only food for his horse was to be obtained from the *top* buried in the trenches of the country, just as the corn-stalks are preserved in the States at the present time, only uncut.

Says Mr. Fisher, of Claremont, New Jersey, in the *American Agricultural Review*, "I planted  $2\frac{1}{2}$  acres of worn out meadow with one bushel of corn, and \$25 worth of Stockbridge manure in the drills. Upon that piece of land I grew 60 tons of corn-fodder, and fed 20 cows on it for 80 days with the same grain-ration I had been giving with the best hay. In less than a week there was an increase of 1 quart of milk per day, per cow, and 9 quarts of milk made a pound of nice yellow butter. My cows are *natives*, and are not selected for their butter-yielding qualities, but for giving a large quantity of milk, as I am a seller of that article. Four dry cows receiving no grain did better than I ever had cows do upon hay alone."

first drying, why is it so much damaged by a second wetting and drying, and almost destroyed if it happen a third time. Wetting clearly does not injure forage, or else hay and straw-chaff would be injured by being sprinkled, and steamed fodder would be utterly ruined. It is the drying after the wetting that robs the forage of its value.

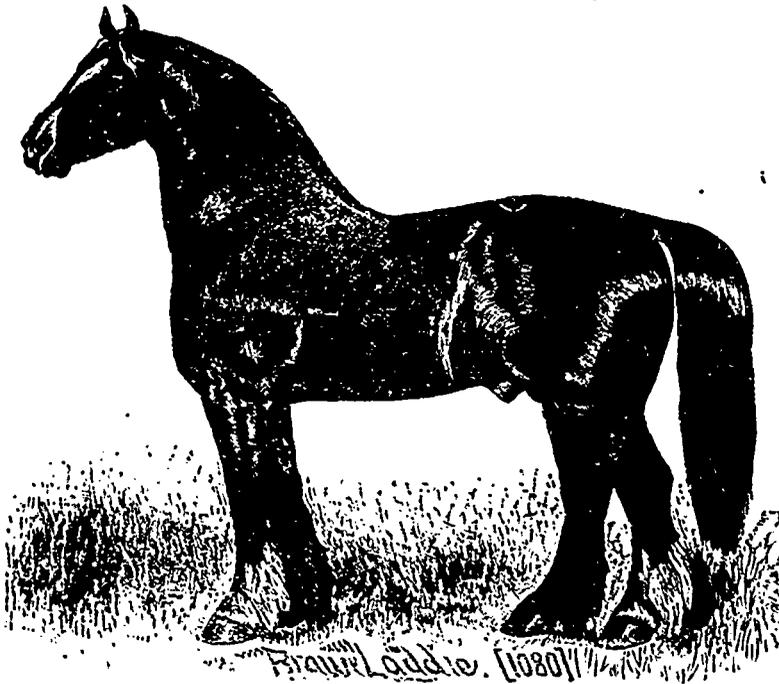
The South-East of England farmer is not satisfied with his hay unless the stack heats and sweats, and steams to that degree, that a stranger to the system would fancy the whole, must soon burst into flame. Chemical action is at work, and great changes are going on in the interior: and so it is with the silo. In both cases, when the fermentation is in progress, starch is being converted in glucose by the action of the mild vegetable acids. A part of the cellulose, or woody fibre, is also converted into sugar, making it more digestible. In my opinion, as a practical man, the chemists have been at work upon something that was not fermented ensilage at all, but merely buried green meat.

I do not, however, go so far as Mr. Morris, of Maryland, who states the value of ensilaged corn at half the value of hay, i. e. \$10 a ton! Mr. Dawes, of St. Anne's, speaks highly of his ensilage, but it was not chaffed, and did not show any signs of having fermented. I take it, the corn was too ripe before it was cut, or had dried after cutting. One question every body should ask. why should butter made from ensilage be yellow, and butter from dried corn stalks be white?

And, now, it is pretty clear we shall have a very short crop

of hay this year. We must look out in time and find something to supply its place. What shall we do? Turnips, svedes, mangolds, etc., we all sow, more or less (I fear me, less), but I think we do not see the full value of *Hungarian grass*. Sown in the first week of June, 3 pecks to the acre, on well worked land, and rolled down, it should be fit to cut late in August. It should be cut as soon as the blossom begins to show, as it soon hardens; but if I had to ensilage it (1), I should cut it very young and sow again; the second crop might be ensiled early in October.

Next, do not, pray, let your clover stand after the majority of the heads are in bloom. Every body tells me the same story: "since I took your advice about my hay-crop, I find it much better, and the animals eat it up much cleaner." This year, much more mixed grasses will be sown than ever before. Mr. Evans told me, on May 3rd, that he was completely cleared out of the fescues, orchard-grass, etc., and had been obliged to send for a fresh supply. So, I hope, the day of that most unprofitable timothy (if sown alone with red clover) is



FRANK LADDIE. [1880]  
CLYDESDALE STALLION.

almost past. A grass that won't bear pasturing cannot be a fit one for us to depend upon. A warning: the *sweet scented*, or *vernal*, meadow grass, does no good here.

	per 100 lbs
Chemical value of ensiled maize, average of 11 analyses	16c.
"    "    "    red clover.	28c.
"    "    "    lucerne	25c.

Three cuttings of red clover on good land, well manured, would certainly give 20 tons, worth \$5.60 a ton, while 30 tons of maize, a full crop, would only be worth \$4.40, and I need hardly say how much superior the state of the land would be after clover for a wheat or oat crop.

In New-Zealand, near Dunedin, Judge Bathgate reports a wheat crop of 94 bushels 17 lbs. per acre; the whole field was 16 acres! I had never heard of anything near this yield before; the greatest crop I ever knew was 83 bushels an acre; but there was only a corner of the piece, about 3 acres, that grew it. This was in Norfolk, near the Fen country. My brother, formerly Bishop of Dunedin, told me, after his first

(1) I propose a new verb, to *ensile*. I shall use it for the future: to *ensilage* is absurd.

visit to his diocese, that he was sure the average crop of barley would be 72 bushels and of oats 84 bushels; wheat he laid at 50 bushels. He was not a bad judge of such things.

ARTHUR R. JENNER FUST.

### THE PERCHERON.

From what was stated in our last issue, on the authority of the official report of Baron de Keerebrecht, the so-called Percheron is not known in France as a distinct breed. In confirmation of that statement we have the additional authority of the Hon. S. Dysart, one of the commissioners appointed by the President to represent the United States at the Paris Exposition, in 1878, who, after referring to the production of the useful general purpose horse known as the Anglo-Norman, says: "The heavier horses are more or less mixed in breeding; but here there seems, as a rule, to have been more system followed to produce a uniform type of a distinct breed. As to how long that course has been pursued, or what was the

foundation used to build upon, no one knows, no record has been kept, and there is no history other than tradition. We must take them as we find them at quite a recent period. The race of horses that is best known in French history, and has more friends than any other, as a medium-size draught horse, is the small Percheron. That they have for a long time been bred without any strong mixture of blood, their uniformity in form and colour is strong proof. There are thousands of them used in Paris in the street cars and omnibus lines, where the labour they perform is very arduous and severe on the physical powers, yet they appear in fine condition. The average size of the small Percheron I should estimate at 1,300 lbs. They are of medium height with a square compact body, indicating activity and great strength for the size of the animal. The limbs are strong, joints short, and muscles strong, with a well formed foot and hard hoof.

"What is called the large Percheron horse, which has a similar colour and form, is about 200 lbs. heavier than the small Percheron. Their limbs and feet are proportionately larger, and they have a slower gait. They are mostly used as cart horses. So far as I could learn, the large Percheron is the produce of a cross between the large Boulonnais horse and

the small Percheron. The Boulonnais horse is the largest and most valuable of that kind of horse in France. They were first brought to notice in the vicinity of Boulogne, but they have spread generally through the region of Paris. They are of about 1,600 lbs. or 1,700 lbs. weight, and have a handsome form for so large an animal. Their action is more clumsy than graceful, and they are principally used for very heavy purposes, where great strength is needed rather than speed. The moving of the heavy blocks of stone used on the building of Paris is done by these horses. It is not unusual to see six or eight of them, in line, drawing blocks of several tons weight, which of necessity must be moved very slowly; they are mostly grey in colour, but bays and blacks are not uncommon. For the purposes to which they are by nature adapted they are entitled to be classed amongst the best draught horses." (1)

The magnificent appearance of the large draught-horses in the streets of Paris, and of the small Percherons in the omnibuses, has been noticed by the numerous American and Canadian visitors to that city, and led to the importation of the

(1) Nat. Live Stock Journal 1879.

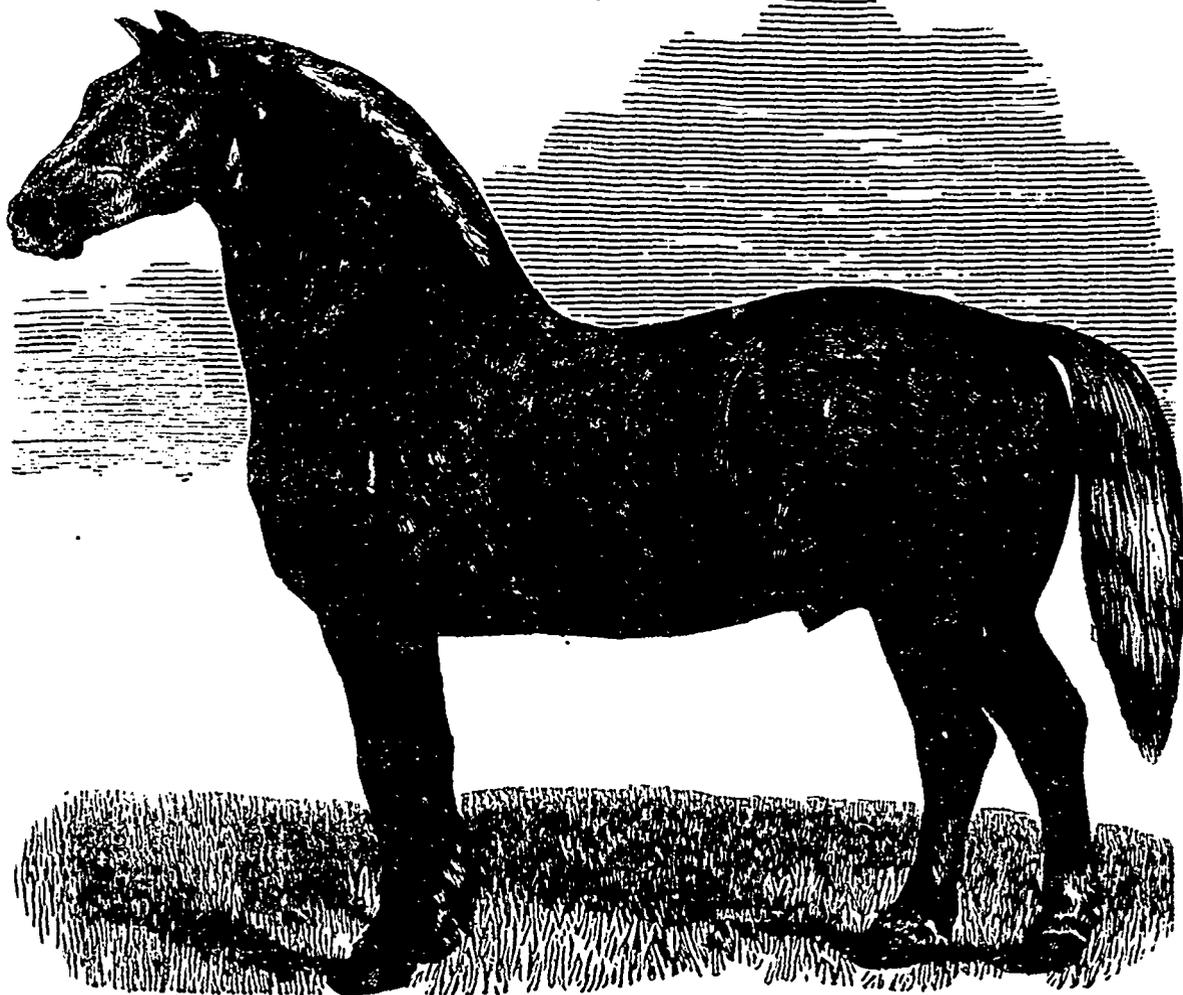
so-called Percherons in considerable numbers to Ohio, Iowa, and Illinois. In 1876, when a convention of importers of French horses met at Peoria, Ills., to decide on the name by which they are to be known, it was found a difficult task to decide. The early importers had named them *Normans*, as they found them in Normandy, many calling them, merely, *French horses*. As in France they are often called *Percherons*, so, some importers adopted that name. To avoid this confusion therefore, it was agreed, after much discussion, to style them *Norman-Percherons*, or *Percheron-Normans*, and by this name they are advertised in the catalogues, and breeders' directories of agricultural papers.

the large cartage companies with which we are professionally connected, enables us to advise our readers as to what is best to breed for the market, and certainly, whatever satisfaction Percherons may have given elsewhere, they cannot be considered a success in this Province; and we do not regret to see that the importation of this breed is no longer carried on. (1)

THE NORMAN HORSE.

The excellence of the Norman horse is a matter of history. It was from that Province, principally, that Napoleon obtained his famous cavalry.

The Norman, perhaps more than any other breed, combines usefulness with a showy carriage, attractive appearance, and



THE PERCHERON.

It will thus be seen that this is not a distinct breed, and that, if it can be claimed to be such, it is not of sufficient antiquity to be relied upon to transmit special qualities when the blood is transfused in cold blooded mares. Hence we find that the crosses of the so-called Percherons, which were ten or twelve years ago imported into the Province, cannot be considered an improvement, in fact they are inferior in every respect to our own French-Canadian, whose lineage goes back to the days when the hardy little Norman horse supplied the quick-moving, never tiring cavalry of France, and whose good qualities were derived from the pure blood crosses of the Arab and Barb, as can be seen to this day in their head, legs and quarters. Our constant, and intimate opportunities of forming correct opinions of the qualities of different crosses in

sound constitution. Stonchenge says of him, "With a fine upstanding forehead, he unites a frame of the most massive

(1) We think it necessary to add, that if the *large* Percheron is not a distinct breed, it is difficult to prove that the *small* Percheron is not. Again, the importation into this province dates back to Mr. Joson Perreault's official career, and was of his selection. It is very evident he did not import a single small Percheron, all being of the heavier kind. And really very poor specimens at that: therefore, the true small Percheron has not yet been tested in our province. Dr. McEachran admits that they are excellent horses, very strong, active and sound. We know, from experience in France, that they are as good a breed as can be found of their size, and they resemble the French-Canadian horse more closely than any other breed in the world. We are therefore sorry that no attempt has been made, so far, to renovate our French-Canadian horse-stock with this very valuable breed.

Ed. A. B.

proportions, and this is moulded in a form as elegant as is consistent with his enormous power. Even the diligence horses of many parts of France are of very handsome frames, and their legs and feet are so sound that they are able to trot over the paved roads at a pace which, slow as it is, would speedily lame our English horses of similar size and strength. Their tempers are also so good that the stallions may be used together with mares in all kinds of work, and although vice in its various forms is not altogether unknown, yet it is comparatively rare." Visitors to France invariably remark the general excellence of the carriage and general purpose horses, and have admired at the Agricultural Expositions the excellent horses, fitted alike for carriage, and farm-work, strong, yet active. Such are called Anglo-Norman, from their being bred from Norman mares and sired by English thoroughbreds, several hundreds of which, under the Empire, were constantly kept at government expense at the different *Haras Nationaux* which were established in the different departments. (To be continued.)

Mr. Britton, of Toronto, a man of very great experience in cattle-dealing, says: "There is a great difference in the quality of cattle, and we do not give any thing like the highest price for common cattle. You may attend twenty fairs in the back country, say on the line of the Northern Railway, and among the 800 of all sizes, ages, and shapes, which you may see, you could not select twenty five that would pay their expenses to Europe. They are, generally, large enough, but are mere masses of coarse, inferior, tough, and insipid meat. They cost more to raise than a thoroughbred animal, as they consume much more food. We buy common cattle at from two to three cents a pound in the fall, to make "chase" or peddling beef, which is sold to the fishermen of the Lower Provinces, "at \$9 per barrel. The labour costs \$2, leaving \$7 for the beef. Ont. Ag. Commission.

**Early maturity of sheep.**—Stephen White says: "We cross with Southdowns, as the lambs mature earlier than those of the larger breeds."

Mr. John Motherwell, of Bathurst, Lanark, is going to cross his sheep with the Southdowns "to secure earlier maturity."

Mr. Stone, Guelph, says: "The Southdowns are the best nurses, and take care of themselves better than the other breeds."

Professor Brown, Agricultural College, Guelph, says, but, here, I do not agree with him. "For early maturity the Leicester is first of all the breeds." I do not think Mr. Brown has ever tried the Hampshire Downs. If he ever does, I will thank him to let me know his opinion. The Leicester lamb would at present prices (say in March) fetch three cents a pound less in London than the Hampshire, i. e. if they both weighed 5 stone (40 lbs.) the Hampshire lamb would bring 40 shillings and the Leicester 35 shillings, a difference of \$1.25 per head.

Mr. Morgan says: "The Southdown sheep is the finest of the Downs;" which is true enough, but he continues: "when dressed it weighs as high as 80 or 90 pounds, about 80 lbs is the popular weight;" and this is, as an average, about 8 or 10 pounds too high. As Mr. Britton says: "Sheep dressing from 70 to 75 pounds are the best class for the English market." The *real* sheep for London is a dark-faced, dark legged sheep, well fleshed, i. e. plenty of lean, ripe, and weighing 9 stone, or 72 pounds. The long-wooled, white faced, heavy sheep always fetch an inferior price; a first rate West

End butcher would lose all his customers if he were to allow one of them to be seen hanging in his shop. It is a ticklish trade, and I recollect well that Allen, of South Audley Street, Grosvenor Square, killed nothing but *Norfolk Downs*, a cross between the old East Anglian heath-sheep and the Downs, hard to fat before three years old, but good on the loin and very high flavoured, with gravy as dark as that from a *seven years old* fallow buck, the fat of which whosoever has eaten and followed it up with a few glasses of still Champagne, need never envy the ancient Gods their nectar and ambrosia.

A. R. J. F.

## THE DAIRY FARMER.

### NOT THE ONLY THING NEEDFUL.

We notice that the Cheshire cheese makers have established a Dairy Farmers' Association. Just now Cheshire cheese is a great drug in the market, and prices for most kinds very low; indeed, to outsiders they seem lower than in any other county. We say to outsiders for this reason—*quality* is the first thing to be inquired about. If the Cheshire farmers' room are filled with cheese, barely medium in quality and some down to very common, then there is no wonder that sales are difficult to effect and prices are low. We see it stated that American cheese of the same quality fetch 10s. higher prices than Cheshire. On the face of it this is evidently incorrect. The American cheeses that fetch 10s. more are of *better quality*. Of that there can be no doubt. Trade in cheese is free enough, and there is competition enough to enable buyers to readily get to the cheapest market. The Cheshire cheese makers seem to think that the one thing needful is to have a monthly fair, in place of at present six fairs in the year, which plan only omits the least important months. The makers want to get to the retailer without the intervention of the "middle man." But if they did away entirely with that profit-loving party, and got a monthly fair, they would find these were not the only things needful. The first thing to do was to make cheese of *finest quality*, for that kind is always in demand, even in the duller times, and fetches good prices even when the lower qualities are quite depressed. Neither the "middle man" nor American cheese affect the makers of really *fine* quality. It is well known that the makers of the *finest* cheese have always "several strings to their bow"—two or three factors ("middle men" waiting) the chance of superseding an old buyer, and bidding over his head. Such cheeses never go to fairs. There is also another item to be taken into consideration. During the last twenty years the taste of the public as regards cheese has been gradually changing, and the Americans have been paying great attention to this matter. Formerly cheese, strong in flavour, if rich in quality, met in some markets with a very ready sale. Indeed, in a few markets, cheeses of really bad flavour forty years ago were actually preferred. Now all this is changed, the great bulk of the public insist upon a pure flavoured cheese; in some select markets the flavour must not be higher than that of cream, and in those markets the highest prices are obtained. People used to talk at the public ordinaries over the high favour of the "Old Cheshire," which then was the kind selected. Such cheeses now are difficult to sell, and the price low, owing to the change that has taken place in the public taste. The peculiar flavour of Cheshire is not now in general favour, except in a comparatively limited number of markets, and that is most likely one reason why Cheshire cheeses now are lower in price than those in some of the other noted cheese making counties.—W. L.

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ED A BARNARD, Director of the Illustrated Journal of Agriculture.

**Advice to Farmers, or how to deal with the Potato-Beetle, Locusts &c.**

First-Prize Essay at the Missisquoi Agricultural Fair, 1880, by the REV. T. W. FYLES, Corresponding Member of the Natural History Society, Montreal.

“From every chink

And secret corner where they slept away  
The wintry storms; or rising from their tombs  
To higher life; by myriads forth at once  
Swarming they pour.” \* \* \*

\* \* \* Through the green wood glade  
Some love to stray; there lodged, amused, and fed,  
In the fresh leaf. Luxurious others make  
In meads their choice, and visit every flower,  
And every latent herb; for the sweet task,  
To propagate their kinds, and where to wrap,  
In what soft beds, their young yet undisclosed,  
Employs their tender care. Some to the house,  
The fold, the dairy, hungry bend their flight.

Thompson's Seasons—SUMMER.

The farmers are the back-bone of the community. Whatever largely affects their interests will be felt throughout the ramifications of society. There are none so exalted as to escape the influence; for, “the king himself is served by the field.” The enquiry then, “How may we best guard against the ravages of insects?” should not only receive attention from the naturalist and the tiller of the soil—it is one that should awaken general interest.

It is not necessary for me to adduce instances of disastrous assaults of insects. They have been so numerous both in ancient and modern times—the narrations of them occupy so many pages in history, both sacred and profane, that I take it for granted that the intelligent reader and the thoughtful observer will at once admit the great importance of the question.

I shall, therefore, without further preface, proceed to the practical consideration of my subject.

Insects affect the farmer through

- I. His growing crops.
- II. His live stock.
- III. His stores.

I. First we will consider those which affect him through his growing crops. And the insect which comes first in mind, because of its present ravages, is *Doryphora decem-lineata*, the Ten-lined Spearman, or, as it is commonly called,

**THE POTATO BEETLE.**

This creature belongs to the order COLEOPTERA, or COVERED-WINGED. It received its name *Doryphora* from the famous American naturalist, Thomas Say, because of its

general resemblance to certain spear bearing beetles of South America, although the spear-like projection from the under part of the body is wanting in this case. It is called *decem-lineata* because of the ten black lines along the elytra or wing-covers. When in flight, the perfect insect, with its cream-coloured and black body, its striped elytra, and its rosy wings, presents a very handsome appearance.

The insect is not a new one; although its advent to these parts is recent. It was met with long ago on the slopes of the Rocky Mountains, where it fed on the wild potato (*Solanum Rostratum*). It was access to the potato-patches of the prairie settlements which gave it that increase of vigour and fecundity which has rendered it so formidable a foe.

*Doryphora 10-lineata*, after leaving the egg, passes through three stages of existence, the larva, the pupa, and the imago states. The first is the voracious stage, when the creature acquires its growth. The second is the quiescent, or dormant stage, in which it lies buried in the earth. The third is the perfect, or winged stage, in which it is migratory and prolific.

In Canada there are three broods in the course of the year, appearing, respectively, in Spring, Midsummer and Autumn. It takes about 50 days for each brood to come to perfection.

The insect is so well known that it would be loss of time to enter into descriptions of it in its various stages.

In dealing with it two things are necessary,—*promptitude*, and *perseverance*.

It is said that the female beetle will lay 1,000 eggs. A moment's calculation will show that supposing the offspring of these, and their progeny also, to arrive at perfection, and half the number to be females, the third or Autumn brood (descended from one pair which appeared in the Spring), would lay eggs numbering 250,000,000. A number, which supposing you could count 60 per minute, for 12 hours per day, and 6 days per week continuously would take nearly 18 years 7 months to count.

The war of extermination should begin at the very first appearance of the insect. The killing of every female in the Spring is the destruction of an incipient host.

Again, the female beetle lays its eggs, (which are of a bright orange, and very conspicuous), in groups of from ten to forty eggs in a group. A patch of 40 eggs can be more readily dealt with, than 40 scattered larvæ.

PROMPTITUDE, then, in the work of destruction is desirable.

PERSEVERANCE also is called for.

The business of depositing eggs is continued for about 30 days by each female. The eggs hatch in 6 or 7 days. The period from the laying of the egg to the development of the perfect insect is usually, as we have seen, about 50 days. As the Spring broods appear in May and June, their offspring will arrive at perfection in June, July and August, and theirs, in turn, in July, August, September and October. And through all this period there will be larvæ in different stages of growth. Unremitted warfare then must be carried on through all the season. And even when the tubers of the potato have reached perfection, and the danger to the present crop is over, every larva, pupa, or perfect beetle should be ruthlessly destroyed, because the insect hibernates in the soil.

Two methods of dealing with the insect have been tried.

1. Gathering.
2. Poisoning.

In gardens the former plan is to be recommended. In fields, separated from other growing crops, the latter is advisable.

By both methods unfortunately the natural parasites of the insect are liable to be destroyed with the creature they prey upon. Gathering is usually performed with a pan and a light stick; and the farmer is wont to consider “all fish

that comes to net." So the various bugs and beetles that live upon *Doryphora 10-lineata*, together with the pest itself, in its different stages of growth—i. e., friends and foes, are involved in a common destruction.

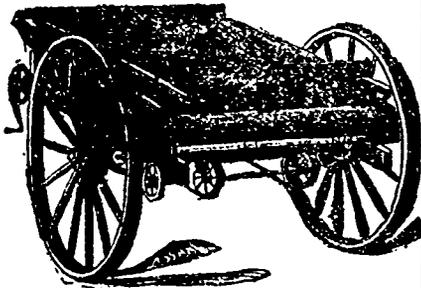
The poison generally in use is Paris green (*Arsenite of Copper*). Doubtless this is a dangerous remedy in the hands of careless people; but it is an efficacious one, and with due precaution it may be safely used. It should either be mixed with flour in the proportion of one part to forty, and dusted on the plants, or it should be stirred up in water—a teaspoonful of the poison to a pailful of the liquid—and sprinkled upon the invaded plants with a small hand-broom. Constant stirring of the mixture is necessary, as the powder is not dissolved in the water: it is only suspended.

What is known as *London Purple* has been recommended as a substitute for Paris green. It contains more than 43 per cent

of arsenic acid, and is therefore, a virulent poison; and, indeed, if used too freely it will crisp the plants. It is much cheaper than Paris green, and is used in the proportion of  $\frac{1}{4}$  lb. to 25 gals. of water.

But there is a better insecticide than either Paris green or London Purple. It is what is called "*Buhach or Dalmatian Powder*." It has hitherto been too expensive for field use; but there is reason to hope that its cost will be very greatly reduced. Buhach is the dried and finely-powdered flower-heads of the plants *Pyrethrum cinerariae-folium*. The Pyrethrum is a native of Southern Europe; but it thrives in California, where it has been introduced by Mr. Milco, a Dalmatian emigrant, who has raised, there, as much as 637 lbs. to the acre. It is recommended that for field-use 1 lb. of the powder should be mixed with 10 lbs. of flour. It is a "dead shot" to the "bugs"!

(To be continued.)



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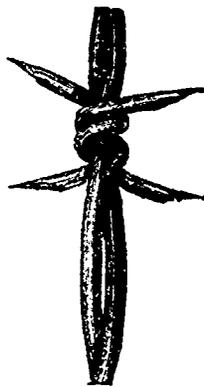
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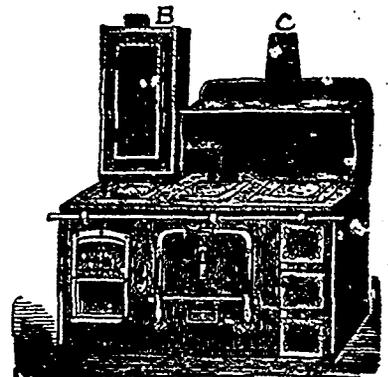
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