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# THE JOURNAL OF AGRICULTURE. ILLUSTRATED

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### Manure for Corn.

What is the best fertiliser for the raising of corn? Where can it be obtained, and for what price?

J. W. TOOF, St. Armand Centre.

#### REPLY.

400 bones raw bone-dust .....	\$6.00
20 bushels hardwood ashes .....	4.00
200 lbs. Sulphate of ammonia .....	8.00
200 lbs. plaster .....	0.80
\$18.80	

The bones can be bought at Nowell's, Common Street; the sulph. ammonia at the gasworks; both in Montreal. Ashes and plaster may be found anywhere.

I should prefer the half of these quantities with a small dressing of dung. The plaster should be dusted over the young corn when eight or ten inches high.

The outlay for one acre of land seems, to an ordinary eye, tremendous; but if yield is wanted, food must be afforded.

With the above dressing—materials pure and in good condition; well mixed and not in lumps—if the cultivation is thorough, the horse-hoe kept at work, and the season favourable, I should expect a yield of 60 bushels to the acre. Corn sells for 80c a bushel, so the value of that quantity would be \$48.00; leaving, after the manure is paid for, \$30 for profit, rent, and labour—horses and men. I say rent, because the interest on the cost of farm and stock is rent, after all said and done.

ARTHUR R. JENNER FUST.

### Manurial Value of Foods.

A correspondent requests me to answer the following question: "Am I wrong in thinking it profitable to feed bran and cotton-meal to milch cows as the cheapest mode of obtaining nitrogen and phosphoric acid?" and he continues: "Pray give us your opinion from the manure as well as from the feeding point of view. We cut and steam. How does this, with hay at \$6.66 a ton, compare, as combined with the manure question, with your grain mixture, and with feeding stuffs generally at present prices?"

I confess that I am in a perfect fog on this subject. All the tables of feeding and manure values I possess are calculated for English or U. S. prices, and the whole matter is so completely muddled at present, that I hardly dare offer an opinion, much less decide positively on such a difficult point.

Take, for instance, bran: the manurial value of bran, as given in the tables calculated for the States, is \$16.15 per ton; that is to say, that after the consumption of a ton of bran by any animal, the manure voided by that animal is worth \$16.15. Now, I could have bought bran this autumn in Sorel (the dearest place!) for \$16.00; it follows, therefore, that the dung produced from the consumption of a ton of bran is worth 15 cents more than the bran itself before feeding! A deduction at which credulity itself stands aghast.

Again, the manure from a ton of cotton-meal is reckoned to be worth \$30.74; i. e. 74 cents more than the cost of the meal delivered on the wharf at Sorel! Would it not better answer our purpose, as far as the manure is concerned, to

apply the bran and meal directly to our fields, than to pass them through the cattle; running the risk, or in most cases incurring the certainty, of losing an immense proportion of their valuable constituents by drainage and evaporation? It would seem so; but here steps in practice, and says—with infinite wisdom, it appears to me: "My dear Sir, don't bother yourself; trust to me and to my experience. Look first at the effects your food has on your cattle; if that is satisfactory, the rejected portions which find their way into your fields will not be wanting in performing the duties expected from them."

But there is another point on which I must insist strongly: when I buy linseed, pease, or other grain, I know what I am using; there is no fear of adulteration; I buy them in open market; I can vary my food as I please, in quality as well as quantity; if the price of one kind is abnormally high, I can use something else in its place, and I am not in the hands of merchants, who can charge just what they please. For instance: a few years ago, a manufacturer of linseed-cake refused to sell his stuff at less than its value in England; freight, insurance, brokerage, &c., being, according to him, unworthy of the slightest consideration.

Again: in every town in this province, at every feed-store, the veriest rubbish is retailed under the name of "moulé"; in most cases, a mixture of bran, reground, and just oats enough to delude the purchaser.

I confess that, all things considered, I prefer food that shows a low manurial value, because in this case it is clear that the animal consuming it reaps the greater benefit. I am using, as usual, pease, oats, and linseed, and the annexed table will show their cost, and their manurial values as compared with those of bran and cotton-seed:

	Nitrogen.	Potash.	Phosphoric acid.	Manurial value per ton.
Ton.	at 18c lb.	6c lb.	10 ct. lb.	
Linseed .. .. . \$40	36.0	12.3	15.4	\$17.51
Pease .. .. . 23	36.0	9.8	8.8	15.87
Oats .. .. . 20	20.6	4.5	6.2	10.27
Bran .. .. . 20	22.0	14.8	32.3	16.15
Cotton-Meal.. 30	62.0	21.0	29.5	30.74

The above table shows the amount of the three elements, nitrogen, potash, and phosphoric acid, in 1,000 pounds of the different foods, and the last column shows the value of one (1,000 lbs.), at the prices mentioned at the head of the columns, after it has passed through the stomachs of the animals. The prices are much lower than those estimated for commercial fertilisers; and so they ought to be, the price of nitrogen especially, because the plants probably take up all their nitrogen from the soil in the form of nitrates, and the formation of these from the nitrogen of the *solid* dung is a work occupying a considerable time. The nitrogen of the urine, however, is quite as valuable as that contained in sulphate of ammonia or nitrate of soda: its conversion into nitrates is very rapid, and its conveyance into the ditches equally so, which somewhat reduces its value.

All this shows how carefully farmyard dung should be guarded from waste. I do not hesitate to say that in the stables of all my neighbours nine-tenths of the urine is lost, and an immense proportion of the most valuable constituents of the solid matter is wantonly dissipated between the stables and the field. Within sight of my windows, as I write, is a vast pile of wheat straw, two years old, rotting away merrily, and the goodman's cattle are lying on bare boards, with their hind quarters clogged with filth. The owner is a man of some education, which is strange. He came into my stable on

Monday, for the first time, and declared that my cows must be dressed like horses every day! They have had neither curry-cumb, brush, nor wisp, over them in their lives, but they have lots of room, enough straw, and a trough behind them into which the dung and urine fall.

It seems to me that I get pretty nearly all the available good out of my cattle-food. Four 4-year old barren heifers bought in September, at an average of \$18.00 each, are still giving 8 imperial quarts of milk a day, and they are ready for the butcher whenever the College Stewart requires them: they weigh about 400 lbs of meat each, and are as good as can be. Now, to pay for what they have eaten, there is the milk 1600 qts, each, at Sorel price, 6 cents a quart in winter = \$96.00; 400 lbs. of beef at 8 cents = \$32.00; skin, fat, &c., say, \$5.00: in all \$133.00! Of course Lincoln College is an excellent customer, but I have only charged what the Principal paid last year, before I took the farm in hand. Then, after the milk and meat, the value of the dung must be reckoned; but this will not represent a great sum, as dung is as cheap here as other things are dear. Still it must be worth twice as much as any I can buy, as it is all there.

ARTHUR R. JENNER FUST.

Lincoln College, March 9th, 1885.

#### PEASE.

I was very much surprised, one day, as I was travelling on the north side of the St. Lawrence, at the sight of some very superior farmhouses, all built of squared stone, many of them four storeys high, with neatly kept yards, brightly painted jalousies, and with a general air of comfort and well-doing pervading the whole surroundings. These, succeeding a district occupied by poor log-houses, miserable cattle, and poverty-stricken people, naturally led me to the conclusion that the soil of the former farms was much superior to the soil of the other farms. However, to make sure, as the snow was too deep on the ground to allow me to judge for myself, I asked the driver of the mail-cart, in which I was sitting, if he could account for the wonderful difference, which I pointed out to him, between the appearance of the two lots of farms. "Easily enough," quoth he; where you see those fine stone houses, the land will grow pease; "where the log-cabins stand, it won't." And, no doubt, according to the then (1869) prevalent ideas, he was right: in those days, it was supposed that to sow pease on light land was a mere waste of seed, time, and labour. A most erroneous conclusion; according to our present notions; for a closer study of the nature of things has led us to the conclusion that the pea is as emphatically a light land plant, as the bean is a heavy land plant. "The pea," says the correct Mr. Stephen, in his *Book of the Farm*, "thrives best on light land." In clay, it produces a large bulk of straw, and the production of grain depends upon the season. On light land, the straw is not superabundant, but the yield of grain is plentiful. I wonder the Scotch ever sow pease; for the constant moisture of their climate, together with the very moderate amount of sunshine they enjoy, must render the pea a very uncertain crop. In fact, I hear that, even on the borders, where *pease-banmocks*, a very hearty, though to me a most nauseous, food, were commonly eaten by the peasants, a field of pease is now rarely seen.

Astonishment is often expressed by Canadians that the English labourers don't eat pease-soup. This is easily accounted for: the English pea won't melt in boiling. In Leicestershire, I believe, and near Tamworth, a few boiling pease are grown, but, as a general rule, they come out of the pot just as hard as they went in; and I know from my own observation, that the Mark Lane corn-factors buy no English

white pease without previously sending a sample out to be boiled.

The use of the pea for feeding hogs is common enough everywhere; it is indispensable in the treatment of young stock of all kinds; by far the best addition to skim-milk in rearing calves is a jelly formed by boiling pease, with about 20% of linseed, after grinding; in producing early lamb for such a market as Montreal, nothing is to be compared with the pea, as it gives consistency and firmness (tautology, I fear) to the otherwise too sappy meat.

As a rule, I think a great mistake is made in feeding hogs entirely on pease. My theory is: rear pigs on green stuff, roots, and pease, until they are put up to fat; fatten them on corn-meal or barley-meal, and finish them off for, say, three weeks, on pease alone. The farmer's pork, in this province, is economical, but decidedly too hard for pleasant eating. I should think that hogs 18 months old would have formed all their lean meat and be firm enough without so many bushels of pease as they get here. Anyhow, there is not the least doubt, that barley- or corn-meal will *salten* much better than pease: Lawes proved that, by most careful experiments, as long ago as 1852—v. Journal R. A. S. of England's magazine, vol. 14, part 11. I quote his conclusions:

When pigs are fed freely upon highly succulent food, such as cooked roots, the refuse of starch-works, and the like, they are frequently found to give a very rapid increase. But pork, so fed, is found to sink rapidly in the salting process, and to waste considerably in boiling. And although the first batch of pigs so fed may fetch a good price, their character is at once detected, and the market closed against a second sale. On the other hand, when pigs are fattened on the highly nitrogenized leguminous seeds (1)—pease being, however, if not an exception, at any rate much less objectionable than some others—the lean is said to be very hard, and the fat also to waste in cooking. Common practice, indeed, has settled, that the cereal grains—barley, oats, &c.—with their low percentage of nitrogenous compounds, constitute in the long run the staple food of the fattening pig; and the whole of the results of the experiments detailed in this paper bear testimony in favour of the correctness of this decision." Another instance, by the bye, of practice having preceded scientific investigation; for many years before Lawes was born, it had been the custom of English farmers to fatten their bacon-hogs on barley-meal and skim-milk, and to finish them off on pease; a practice which the experiments of Sir John Lawes show to be founded on sound principles.

The composition of the pea is this:

(a) Water.. .. .	14.5	(b) Nutritive ratio..	2. 9
Albuminoids .....	20.2	Value per 100 lbs..	\$1.44
Carbohydrates .....	55.4	Compared with {	2.25
Fat .....	1.7	meadow hay... 1 }	

In the above table, b. the value per hundred pounds—\$1.44—must be taken for what it is worth. The calculation is from an American publication (Stewart on feeding), and is founded on timothy hay at \$21.80 a ton! I really cannot make anything useful out of the columns on columns of figures given in the new system of values of feeding-stuffs. For example: according to table b, pease are worth, first, \$28.80 a ton; but, compared with meadow-hay, as they represent a value of 2.25; now meadow-hay is put in the tables at 61c per 100 lbs = \$12.80 a ton, ergo pease should be worth \$12.80 x 2.25 = £29.80 a ton. Now, I buy my pease

—famous soup-pease too—at \$23.90 a ton, and best timothy at \$6.66; so the tables only succeed in perfectly stupefying me.

**Sowing Pease.**—Like every other far n-plant, pease in my days were always sown broadcast. But early in the thirties, the practice of drilling them began to obtain in the south of England, though as late even as 1853, I saw farmers in Shropshire broadcasting their pease. We used to set them about 27 inches apart, and sowed thickly—about 3 bushels to the acre. As soon as they were up, the harrows were passed across the rows; they were then ed-vo-hoed, once—a man got over about an acre a day—and the horse-hoe was kept at work until the pease "shook hands," when a single row of rape was drilled between each two rows of pease, a light dressing of bone-dust or of superphosphate (later) being hand-sown with the rape. This was for sheep-feed, after the crop was carried, and was of great benefit to the land, particularly the lighter land, on which wheat hardly ever succeeds after pease without a sheep folding. After the removal of the pea-crop, the spaces between the rows of rape, where the pease had sood, were horse-hoed once or twice, and the land was left as clean as a garden, and in beautiful tith. Where land is managed thus, and the season is not too wet, there need be no fear of the results. There used to be in Kent a small machine attached to a one wheeled plough, by means of which beans or pease could be deposited at the bottom of the furrows; in practice, this was set to sow every third furrow, and thus, as the plough turned over a width of 9 inches in its passage, the rows of pease were at the proper distance of 27 inches.

The land should be as carefully prepared for a pea-crop as for any other. An autumn ploughing, well grubbed and harrowed, and the seed deposited 2½ or 3 inches deep, will be found to answer. My neighbour, Mr. Lavallée, ploughed in his pease last spring, and was well pleased with the result. I shall sow my pease with a single row (Mathews) garden drill, 27 apart—a man, if the land is in good state, will get over 2½ acres a day—and horse-hoe them as usual. I want to know this: You sow your beans in rows and hoe them, why not treat pease in the same way? If the quantity of seed per acre were increased, there would not be so many complaints of pease not podding. If I have time, I mean to try an acre drilled up as for mangels, sow the three bushels of pease broadcast, and cover them in with a single time of the harrows.

**Harvesting pease**—Whether broadcasted or drilled the cutting may be done with a short-bladed scythe better than with one of the ordinary length. The old fashioned Hainault-scythe answers capitally for this purpose, (engraving in May no). When dried enough, they are rolled up in bundles, bound with a drawn out wisp of their own straw, and carried home to the barn or stack.

Canadians often mixed a few pease with their oats for seed. In England, it used to be the fashion too, but is so no longer; the crop was called *mashin*, quasi *mestlin*, i. e. *mélange*, from the French *mêler* to mix—formerly spelled *mester*. Here it is called *gabourage*, or, nearer Quebec, *joudriote* both of which words are undervivable by me, which is a bore.

ARTHUR R. JENNER FUST.

OUR ENGRAVINGS.

**Jersey Heifer, Elsie Lane.**—A perfect representation of the more refined type of Jerseys, as the engraving of Sainte Clémentaise, in our last, was of an old-fashioned sort.

**The Druid.**—A model Clydesdale stallion, showing, to my mind, indubitable signs of the mixture of Shire blood.

**Illustrations of drainage.**—V. article on that subject.

(1) By "other leguminous seeds," Lawes means horse-beans, vetches, &c.

*Berkshire sows.*—A good couple of specimens, not so overloaded with fat as specimens usually are. This is the practical breed, after all, and is already gaining a position for itself in our rather backward district of Sorel.

### CAMEMBERT CHEESE.

TO THE EDITOR JOURNAL OF AGRICULTURE.

*Sir,*—It may be interesting to some of your readers to know that, from experiments made in the manufacture of the above named cheese, I find after following the directions given by Mr. Granville Baker, in his paper read before the dairy conference at Gloucester, Eng., as published in the July number of your paper, that the cheese can be easily made, is palatable, nutritious, and profitable. The evening's milk was skimmed next morning, the whole of the cream and half the

family we have used no other cheese since the month of August.

Yours truly,

F. C. IRELAND,

Dec. 5th 1884.

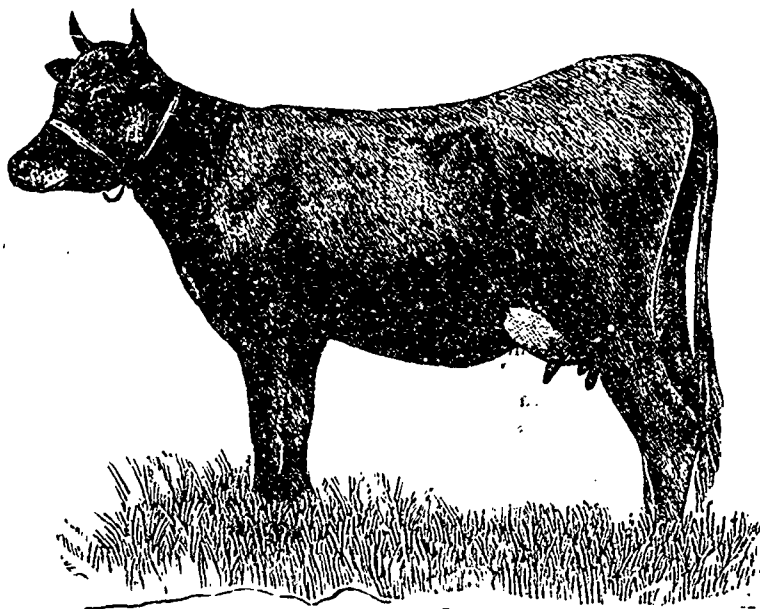
Lachute Mills.

### CAMEMBERT CHEESE.

Lachute Milk, Feb. 21st 1885

ARTHUR R. JENNER FUST, Lincoln College, Sorel.

*Dear Sir,*—In reply to yours of 18th beg to say that the curd does not break up, it is of the consistency of thick starch, when put into the rings; no pressure whatever is used. The whey runs off through the perforated tin rings—perforated on the sides and bottom. If you follow directions in my article, and read the article in the July or August number of the Journal of Agriculture you can't fail to make Camembert



JERSEY HEIFER ELSIE LANE 13302, THE PROPERTY OF LYMAN A. MILLS, MIDDLEFIELD, CT.

skim was put into the morning's milk brought to a temperature of 86 degrees, and a table spoonfull of rennet put into it and set away—that quantity of rennet to five gallons of milk—This was left standing in the cellar for four or five hours until the curd was so firm that the finger could be passed over it without any sticking. The curd was then laded out and put into tin rings  $4\frac{1}{2}$  inches in diameter by 6 inches high, perforated and stood on perforated tin sheets so that the whey could run out. The cheeses were turned every night and morning for two days, and then taken out of the rings, salted, and put away on slats in a dark part of the cellar to dry. They were still turned every night and morning, and in a few days became covered with a white mould, which in another day turned yellow and soon after commenced to dry and ripen, and in three weeks were out and found very good, and in a few weeks more were excellent. It is a simple process, requires very little milk and can be made by almost any dairy maid who will follow these directions. Half the milk or the whole of the milk of one cow can be made into this kind of cheese, or the milk of a 100 cows, as convenience or circumstances require. Several persons have commenced to make this cheese for private use, and in my

cheese. We are making it all winter, but it is not so rich as what we made in September. It is a very healthy cheese, and should become a general favourite. I have learned that the rings should have a lid at each end, perforated same as sides, as while the curd is yet soft it is difficult turning without the lid, also if you have lids, you do not require reed mats. A simple tin ring, open at each end, sides perforated, and a perforated lid for top and bottom, to come off as easily as the lid of a boot-black box; then on the bottom lid, let some little projection be fastened to the lid, so as to let the whey run out, or set your rings on two wooden slats, any thing to keep it draining off slowly. The perforations do not want to be larger than to let a fine knitting needle, or something like that, through, mine would scarcely let a pin through. The whole process is so simple that you will be liable to err by taking too much trouble, if you err at all in your experiment. There is a rennet sold now by suppliers of cheese-manufacturers' materials which I find the best. It is in powder, and very little of it does. Wishing you success, I am yours truly (1)

F. C. IRELAND.

(1) In the third line from the bottom, Mr. Ireland writes *renneting*.

## BLANCHING CELERY.

In answer to occasional inquiries, we give the mode of blanching celery which we find best on the whole, after trying different ways, where moderate quantities are raised for home use, and where the supply is chiefly desired for early spring use, as at this season it appears to be more particularly sought when its crisp and fresh quality is particularly grateful to the palate on the accession of the first warm weather. The mode admits of easy access to it any time in winter.

The treatment differs from the well known mode of placing it in trenches late in autumn, as shown in fig. 1, only in the mode of covering. A smooth trench is cut the same width

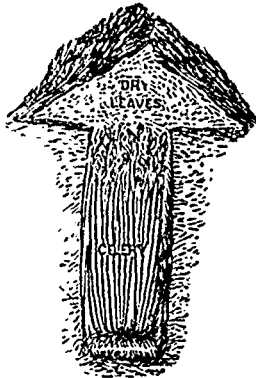


Fig. 1.

as the spade, and just deep enough to allow the plants to stand erect and reach the surface of the ground. For spring use, the plants are placed in the trench as late in autumn as the weather will allow before freezing up, and as compactly in the trench as may be practicable without bruising. The more common mode is to cover with a rough board roof and then with earth, thick enough to prevent freezing, and an improved mode is to use dry leaves as shown in the cut. A roof of evergreen branches placed over the leaves keeps the leaves in place, and throws off much of the water of rains; but instead of pointing upwards as the cut represents, they should be placed tops downwards for carrying off the rain. There is an objection to this mode, as represented in the cut. The leaves become more or less wet by near proximity to the earth and by some of the rains from above, and resting on the plants injure them and cause partial decay. This is entirely or easily prevented by first covering the plants well with short evergreen branches laid across and over the plants. On these the leaves are laid in the roof-form as represented, and lastly they are covered with the inverted branches as a two-sided roof. The kinds of evergreen used should be such as naturally lie rather flat, like the common hemlock or the Norway spruce. The chief point to be observed in this method is the use of the evergreen cover directly over the plants,



Fig. 2.

and between them and the leaves. In taking out the blanched celery in winter or spring, a small portion is uncovered at a time, and the clean and fresh appearance of the stems, with

their ivory whiteness under the green branches, shows the success of the practice.

For early spring use the plants are not banked up during growth, but are placed green in the trench, where the blanching process is affected; or if for use in winter, all that is necessary is to take them up and place them in the trench earlier in November. As a general rule, the first layer of evergreens across the trench will be a sufficient cover until the ground freezes, after which the leaves are successively added.

Where large quantities are raised they may be stored in frost-proof pits, of greater or less dimensions, covered with board roofs and leaves or straw, as represented in fig 2.

## Farm-accounts.

The Council of the Royal Agricultural Society of England have just offered a prize for the best and simplest form of keeping farm accounts, including all field operations, breeding, feeding, &c. We submit that a really good intention is here in danger of being marred by an attempt at excessive comprehensiveness. It is not too much to say that no really efficient form of keeping farm accounts will ever include particulars of feeding, still less of breeding. Nor is it at all desirable that too many of the "field operations" should get reported in the cash book. It is no doubt a good thing (indeed it is an essential thing) that the farmer should take notice, and keep notes, of every process of the farm; and that he should well consider the cost; but if he be wise, he will not allow entries which relate to these subjects to cumber and render difficult of reference the true account books of the farm.

As a general rule, a diary (folio size) to be regularly written up will suffice for memoranda of every day's operation of every kind. And a farmer, who methodically and fully attends to this each day, will have—in its pages—all the requisite materials for keeping—when time allows him to attend to them—his cash book, his cultivation register, and his live stock account properly filled in. There are in existence already good forms for recording the labour engaged in farm cultivation; and there is at least one good private herd book which has been reviewed in these columns. And good account books, giving space for classifying items under different heads, are to be had at every stationer's. What will supersede these? Any attempt to include everything under one cover—and indeed all elaborate estimates of the cost of each crop—must end in a waste of time which could be more profitably occupied otherwise: and there will probably be a great increase in fancy figures, which do more to hide from a farmer his real position than anything else. Estimates of the cost of every crop are wholesome exercise no doubt, but they inevitably include too much guess work: and for the purpose of showing the farmer's true financial position, which is the proper end of account keeping, they would have little or no value.

We are not going to quote as praiseworthy the successful farmers who have never kept any accounts at all beyond their bank book, any more than we shall ever be likely to quote the successful men who cannot read. But it is certainly true that a mere daily record of cash transactions, when combined with a confirmed habit of paying cash and requiring prompt payment, is all that has been absolutely necessary in the history of many men who have grown from small means to comparative wealth. This fact is not mentioned here to discourage more copious note-making, because it has been frequently insisted that more ample registration of details of all kinds of farm practice is eminently desirable. But the terms in which the Royal Agricultural Society of England an-

nounce their offer strongly indicate a disposition to introduce into a department, which is unsuited for it, the popular passion for complicated machinery.

An elaborate system of book-keeping is essential where many clerks and underlings are required. But a farmer does not conduct a business of this kind. He is, or should be, his own cashier, paymaster, and salesman, and his greatest capital is his own eye and his own presence.

Our well-intentioned friends must not bind on the farmer burdens which are intolerable. An out-door, active man, he must be for his business to prosper. It is futile to expect that, in addition to this, he will go through every day the duties of a clerk in a counting-house. (1)

#### VETERINARY DEPARTMENT.

Under the direction of Dr. McEachran, F. R. C. V. S.

##### Colic.

Abdominal pain may arise from functional derangement of the intestinal canal, or it may be due to organic lesions of varying extent and nature. To the former disturbance the term of *true colic* is applied, while, when depending on the latter, it is spoken of as *false colic*. There are two varieties of true colic which may be associated together. The one, spasmodic colic, is due to muscular contraction of the muscular walls of the gut, the other, termed *flatulent colic*, is owing to accumulation of gas in the intestines. Colic may be due to dietetic errors such as foul food, bad water, &c.—also to overfeeding, sudden changes in diet, irregularities in the dieting, taking a large amount of food after a long fast, or after prolonged or severe exertion: food of inferior or unsuitable quality is also a potent agent in the production of spasmodic intestinal contraction, as well as of flatulent distention, which may be associated with the spasm or occur independently. Besides dietetic errors, there are many other causes of colic. This painful affection may be due to intestinal obstruction from mechanical displacement, and change in position of different part of intestines, or from impaction of calculi, stones, or other concretions of varying composition.

Not unfrequently, colic depends upon the presence of animal parasites in the bowels, and sometimes also in neighbouring parts. Young animals, especially, when badly fed and attended to, are more liable to colic from this source than older horses. Pain, when originating from the presence of worms, is usually of a recurrent type, and attended with progressing debility and loss of flesh. Irritant poisons when ingested produce pain, sometimes very intense. Cold and damp are also very exciting causes of this affection. Lastly, as causes of colic, are a group of organic diseases, not only of the intestine itself, but also of the membrane lining the abdominal cavity, kidneys, liver, &c.

**SYMPTOMS OF SPASMODIC COLIC**—The onset is generally more or less sudden. The horse shows signs of abdominal pain by looking round at his flanks, by restlessness, striking at his belly with his hind feet, and in various other ways. He lies down and rolls from side to side. After a time he rises and eats a little, and soon, perhaps, pain attacks him again. In uncomplicated cases of colic the number of pulses and respirations and the temperature are rarely elevated, except during the spasms, when the pulse becomes hurried.

(1) I am glad to see that my friend Mr Morton takes my view of this subject. I never yet knew a successful farmer who bothered himself much about book-keeping. I will engage to say that no two English farmers would agree as to the cost of growing an acre of wheat or of swedes. What is the value of a load of dung? Who knows? I am sure I don't: Mr. Brown, of Guelph, says it is worth \$3 50! Could he sell it for half that? Decidedly not. A. R. J. F.

and respiration labored. The attack may now subside or gradually become more and more severe, the spasms becoming more continuous and the pain more intense. The restlessness and excitability increase, and the attack, if unrelieved, may end in death.

In most cases of colic the bowels are constipated, and the feces, if any are passed, are usually hard. The urine is usually retained or passed in a jerky manner.

**SYMPTOMS OF FLATULENT COLIC.**—Due to distention of the intestines with gas, may be associated with spasm of the muscular coats, or it may occur independently of that variety, attributed especially to digestive disturbance, depending on ingestion of food prone to undergo fermentation. This form usually comes on suddenly. The horse is noticed to be very restless, and the abdomen distends and becomes tense, giving a tympanic note on percussion. The breathing is short, the pulse increased in frequency, and is feeble. The extremities are very cold, and when the animal attempts to lie down, he does not throw himself suddenly on the ground, as in spasmodic colic, but allows himself to fall more slowly and carefully. If unrelieved, the continued distention may lead to death from asphyxia, sometimes rupture of a part of the bowel or diaphragm is the cause of death.

The post mortem signs are very seldom marked; in many instances no change is to be found in the walls of the intestine, though these are not unfrequently somewhat thickened. In many cases, parasites, or various kinds of concretions to which the pain was due, may be found after death.

**TREATMENT.**—In all cases of colic when diarrhoea is not present it is advisable to commence treatment by the administration of a purgative. Raw linseed oil is the best we know of in these cases, and should be given in quart doses. If the pain is very severe it is good treatment to administer with the oil an ounce each of sulphuric ether and laudanum. In addition to the above, enemata of warm water should be given and repeated at intervals of two and three hours, if necessary. If within an hour the pain has not abated, the above doses of opium and ether should be again given in half a pint of water. Hot fomentations, poultices, may be applied with advantage to the belly.

**TREATMENT OF FLATULENT WINDY COLIC.**—Commence as in the spasmodic variety by giving a quart of raw linseed oil, to which must be added some remedy to dispel the accumulated gas. For this purpose we find that the spirits of turpentine, in two ounce doses, acts as well as any other medicine. If there be much pain the addition of two ounces of laudanum to the above mixture will be found efficacious. Tapping the distended abdomen is recommended, but we think the trocar a dangerous instrument in the hands of any but a skilful surgeon.

C. McEACHRAN, V. S.

#### Propagation of disease through Milk.

Modern investigation has shown that all contagious diseases are produced by germs, the growth of the disease being no thing else but a kind of fermentation or putrefaction of living tissues. Milk, though a fluid, is nothing else but a tissue, having the same chemical conformation, and affording everything necessary for the growth and nourishment of the disease germs. Hence, if a typhoid germ, for instance, fall into milk, it will grow and prosper, and if the milk be given in food to man or beast, the disease is quite susceptible of further development. That this really occurs has been shown by experience in many well authenticated cases.

The introduction of disease germs into milk is often effected by adulteration with unhealthy water, or by the



handling of dairy utensils by persons who have been in contact with the sick. A very common source of danger to milk is the proximity to the dairy of fetid odours proceeding from dung-piles and rotting organic matter. The locality of the dairy is, consequently, a matter of great importance, especially to milk vendors, who may often give rise to sickness by placing their milk within reach of disease germs.

Another important question in connection with this subject is the spread of *consumption* by milk; whether this occurs or not is as yet a matter of uncertainty; there are however, good reasons to believe that consumption may be communicated through milk. A number of experiments have been made, the most famous of which are those of the German physicians Serlach, Klebs, and Bollinger. Serlach fed two calves, two pigs, one sheep, and two rabbits, for three weeks, with the unboiled milk of a cow affected by a tubercular disease; the whole of the animals were soon suffering from the same illness. Klebs made a like experiment with nine guinea pigs and with the same result. Many other trials by physicians have shown that tubercular diseases can be com-

communicated, and the strictest legislation has been put in force of late years. (1)

J. O. MIGNAULT.  
Analytical Chemist,  
162 St. James St., Montreal.

ROYAL AGRICULTURAL SHOW AT SHREWSBURY.  
(1884.)

**JERSEYS.**—Although considerably below the numbers which have been assembled at a Royal, these classes were of very high merit, and the selection made with greatest care to distinguish the most serviceable type. Great attention seemed to be paid to "yellow points," as involving highly-coloured cream. *In every class this seemed to be taken into account even more than the colour of the hair.* Certain specimens, as Mr. H. S. Watt's Cream of Jersey, the same owner's Morning Star, and Mr. H. J. Cornish's Carlo's Adrienne and Earl of St. Martin seemed, to a non-initiated



POLLED ABERDEEN-ANGUS BULL JUSTICE 1462.

municated through milk; on the other hand in numerous cases, the animals experimented upon, continued to enjoy health.

The source of a new kind of fever was traced a few years ago to the milk of an Aberdeen dairy; twenty persons were attacked, and three died; the connection of the milk with the epidemic was clearly shown by the fact that none suffered but those who had drunk of the unboiled milk. The most convenient way of ridding milk of disease is by boiling it before use; the germs appear to be destroyed by this process.

The danger arising from infected milk is not imaginary but quite real, especially in large centres. If Montreal be taken for an example, where at least 6000 gallons of milk are consumed daily; of these 6000 gallons, at least 30 gallons are infected, if the percentage of cows afflicted by diseases contagious through milk be put at  $\frac{1}{2}$  per cent. In the course of a year it may be readily seen that 30 gallons of milk are infected; this calculation the quantity of milk of healthy cows, which has become diseased by proximity to disease-germs.

This state of things has been understood in European

countries, and the strictest legislation has been put in force of late years. (1) **looker-on, almost ideally perfect specimens.** Mr. G. M. Alender showed a bull, Gilderoy, which, although Island-bred, looked as if it might have a remote tinge of Devon blood; (2) or perhaps (what is more likely to be true) it represents that form of the original Keltic breed out of which the Devon has been developed. Mrs Macintosh's Verbena 2nd, a very charming cow, had a yearling son Valentine, which was commended. The pains with which these classes were judged was very commendable. No breed in the show received more attention, nor perhaps deserved more. It was an admirably represented variety, containing five specimens of the very choicest type.

**ENSLAGE.**—By invitation from Mr. W. J. Harris, M. P., a large company recently met at Halwill Town Farm, Devon,

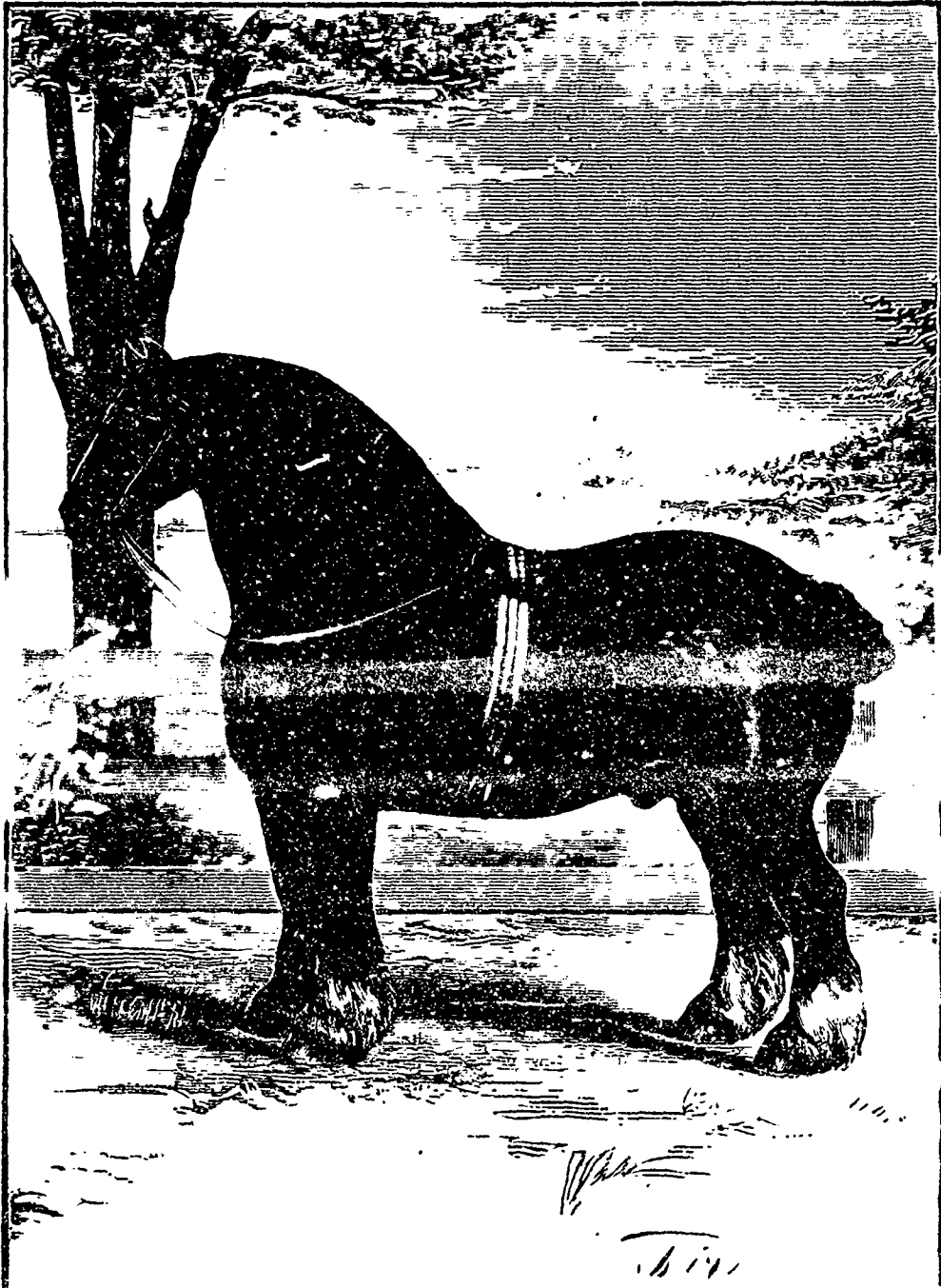
(1) Many thanks for a very sensible warning. It is by no means impossible that cholera may be among's next summer, and all experience of that dire disease goes to prove that cleanliness and pluck are the best prophylactics. A. R. J. F.

(2) Just what was said of Mr. Whitfield's young bull in 1882! A. R. J. F.



to witness the opening of two silos which were filled during the summer. In one of the silos were stored 100 tons of ensilage extending to a height of nine feet. The ensilage consisted of seed grass, (1) which was carried in dry weather and had been subjected to a pressure of 70lbs. per square foot in a cement-lined silo. The ensilage was in excellent condition,

together in dripping condition during very wet weather. It was much darker in colour than the seed grass ensilage, but weighed 50lbs. per cubic foot. The store in each silo was damaged to the depth of about three inches from the top, but this being foreseen, a layer of rushes of that thickness had been placed on the top of the grass, and as rushes were valu-



“ DRUID. ”

of a light-brown color, emitted a pleasant smell, and weighed 40lbs. per cubic foot. In the second silo were 150 tons of ensilage, consisting of meadow grass, which had been put to-

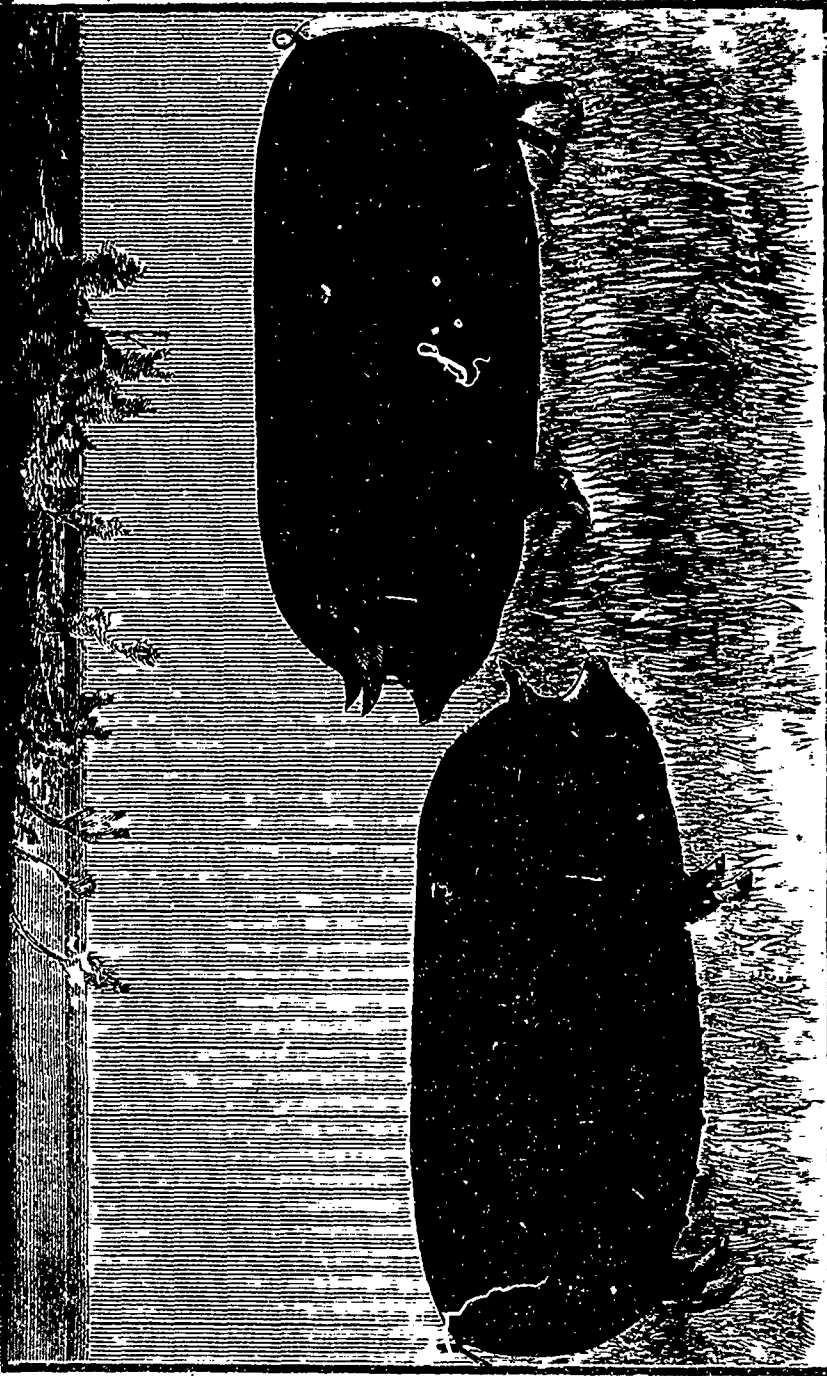
(1) *Seed-grass*, i. e. sown grasses, as distinguished from permanent meadows,  
A. R. J. F.

able as manure there was really no loss. (2) A sample of clover ensilage taken from the top of a silo not yet opened was also shown. Mr. Harris pointed out that all the seed was saved

(2) Staff!

the ensilage, whilst in hay a large quantity drops out. (1) This is important, as the food value depended largely upon the quantity of seed preserved in the grass. Mr. Harris explained that he considered the ensilage weighed four times as much as it would have done if the grass had been converted into hay. Its entire cost of production, including the rental of the

ensilage was used. His cart horses lived on it entirely, and had no hay whatever. He did not give it to the hunters as a rule, but if they came in tired after a very hard day's work, when generally it was difficult to get them to eat, he gave them a little ensilage and found it an excellent appetiser.— Great disappointment is felt throughout the extensive dairy districts of Cheshire at the issue of a circular by Mr. Haddon, manager of the Anglo Swiss Condensed Milk Company, Middlewich, condemning the use of ensilage for dairy cattle, and declining to take further milk supplies from Cheshire dairy farmers who use ensilage. (1)



BERKSHIRES, the property of T. L. Miller & Co., Beecher, Ills.

**MELON GROWING MADE EASY.** — Most amateur gardeners (says a correspondent in the *Field*) look upon the melon as a "out above" them, and either never try to cultivate it, or trying, take so much trouble with it that they fail. As a matter of fact, nothing that requires artificial heat is more easily grown than the melon, if one only knows how. In the first place, there should be no attempt at starting the seed until the winter cold has got the chill off, say about the first week in March. Then make up your hot bed, and at once (without waiting for the heat to go down) place upon it, near the top, about a stable bucketful of soil composed of the top spit of an old meadow, some fresh horse droppings, and a little sand, mixed together, but not sifted. Upon the soil draw an imaginary triangle, a foot each way, and at each angle put in one seed. Place a sheet of glass on the soil, and leave your lights off until the seeds come through. By that time the heat will have gone down to about the proper temperature. Now get three small flower pots, plunge them in the hot bed, and put a seed in each, to fall back upon in case of accident, or to plant out presently under another light. In the centre of the triangle make a round hole, and pour water every morning into this hole, being careful that no wet gets to the collar of the plants. When the latter have grown about four or five inches stop them, and when side shoots are thrown out stop them also, until fruit buds are formed.

land, the expense of manuring the land, the interest of the capital expended on the silos amounted to 14s. per ton. (2) He considered that fewer roots were required on the farm when

Do not water them overhead until the weather is really warm, and then do so either early in the morning, or late at night. When the flowers are opening, leave off the watering-can rose, and give water only at the roots. Give plenty of air night and day after June, and shade from very hot sun. It is bet-

(1) Devonshire people always let the grass stand too long before mowing.

A. R. J. F.

(2) A crop of roots should not cost more than \$1.75 a ton.

A. R. J. F.

(1) Go slowly about your siloes my brother farmers. It is not a settled point yet.

A. R. J. F.

tor to fertilise the flowers oneself then to leave it to the bees. By taking a little trouble you may have all your melons swelling at the same time—a very desirable but not absolutely necessary matter. If you like to put the sweepings of your lawn round your frame, do so; they will do no harm, and in a cold summer will help the melons to ripen. Having done all these things—have patience. The fruit will seem long in ripening; still, it will ripen, if left long enough. My last melon this year, grown without any artificial heat whatever, was not ripe till October. (1)

#### Advertising Fairs and Expositions.

The following paper on Advertising Fairs and Expositions was presented by Mr Festus J. Wade, Secretary of the Great St Louis Fair, and Recording Secretary of the International Association, at the Convention of the International Association of Fairs and Expositions, which was held in St. Louis, Mo., on December 3rd and 4th.

#### "HOW, WHEN AND WHERE TO ADVERTISE."

"The problem of how, when and where to advertise is one in which all trades, professions and industries are equally interested and anxious to solve; and in selecting it as a subject I recognize its importance to our associations, and the advisability of considering it in detail. I will therefore conform my ideas entirely to the advertisement of agricultural and mechanical associations and exposition societies. The numerous mediums through which advertisements may be circulated, make it incumbent upon officials to use their utmost discretion in deciding upon the merits of the schemes presented; and, in order to place the matter in tangible form, I have made four divisions of the more important mediums, subdivided as follows:

"First—The Press.

"Second—Posters and premium lists.

"Third—Circulars, pamphlets, &c.

"Fourth—By co-operation with kindred associations, live stock and industrial societies, merchants and manufacturers generally.

#### "THE PRESS."

"It is universally conceded that the press of the country has done more to advance and promote agricultural and mechanical associations and exposition societies than any other profession, trade or industry throughout the American continent. Broad as this assertion may seem, I believe that a careful consideration of it will convince the most sceptical of its correctness. Assuming this to be a fact, then, the press of the country is undoubtedly the most valuable of all advertising mediums, and should be treated upon a basis that would be commensurate with its value to our respective organisations. This should be done by extending every reasonable courtesy, or collecting interesting items, and lastly, by the most liberal and judicious patronage in advertisements that may in a slight measure repay those whose energy, intellect and enterprise are devoted to the profession of journalism. The preparation of newspaper advertisements should receive a most careful consideration, attractiveness in appearance and originality in design should be the aim of every advertiser in order to secure the attention of the most casual reader. Special features of the exhibition should be made known in the shortest and most concise manner, and in order to receive

(1) Good advice for the English climate, but, here, the lights must be put on as soon as the bed is made up. The hints about watering the earth and not the plant are of great value.

A. R. J. F.

the greatest returns from the amount expended, it is very necessary to determine upon the all-important question of

#### WHEN AND WHERE TO ADVERTISE.

"Advertisements designed to reach the ordinary exhibitor or visitor, if inserted about three or five weeks previous to the exhibition and continued until the opening day, would seem to me to be the most profitable, and in order to find out where to advertise, it would be advisable to ascertain the radius from which exhibitors and visitors attend the exhibition. This may be done by soliciting from railroad and other transportation companies a statement of the percentage of travel over each line from a distance of 50, 100, 200, 300, or 500 miles, and from the information thus acquired a tangible basis can be determined upon as to where to advertise the next exhibition. To reach special exhibits this, of course, does not apply, for instance to a paper devoted to live stock interests, whether in New York or San Francisco, might be used, if you are satisfied that by such mediums you will reach the class of exhibitors particularly desired. Advertising in the form of 'locals' or 'reading notices' I regard as most valuable as well as economical. It is true that the price per line costs three or four times as much as the regular advertising columns, but I maintain that where proper attention is devoted to the composition of a 'local' it will be read by four or five times as many readers as will be the regular advertising columns. If I were to ask the gentlemen here present, or any other company of business men, how often do they read the promiscuous advertisements I believe the force of this argument would be evidenced.

#### POSTERS.

"The judicious circulation of a neat and attractive poster giving a comprehensive summary of the fairs and expositions, is a most excellent and profitable advertisement where proper care is given to the distribution in towns and cities adjacent to the exhibition, and in order to place them to advantage, I do not think it advisable to send them out upon the supposition that the public generally will see that they are prominently located. The members of this association could accomplish much good by suggesting the best manner of placing posters in their respective localities whenever solicited. In large cities and towns the hiring of bill-posters is, I believe, the most profitable and economical manner of distributing advertising matter of this character. It is true it will generally increase the expense, but if posters are prepared to go before the public, it is better to issue a smaller number and have them properly placed, than to issue a large number and have two-thirds wasted. Of course, where posters are solicited by railroads, whose pecuniary object is to have the Fair well advertised over the territory they traverse, a reasonable supply should always be granted, or when wholesale merchants or manufacturers will issue a private circular to their customers or agents, asking as a special favor that they post the bills conspicuously, and at the same time indorse the character of the Fair or Exposition, then I believe more attention will be paid to placing the advertisement, as it will be done with a view of accommodating rather than advertising a show in which no special interests centres to the person thus solicited.

#### PREMIUM LIST.

"The premium list is a most valuable medium and I believe it would be profitable to embody a prospectus of the approaching Fair, and also a short description of the previous exhibits at the head of each department, thus giving those who receive a copy, whether visitors or exhibitors, an

idea of what they may expect by attending the fair or exposition. Then especial care should be taken in the classification of premiums; in adding new and improved breeds in the live stock classes; enumerating new mechanical contrivances, industries and labor-saving inventions; the adoption of rules and regulations that are applicable and in keeping with the progress of the country. It will also add materially to the attractiveness of the list to have them illustrated with views of the grounds, different breeds of live stock, industrial arts, building, &c. To secure profitable circulation I would suggest that officers should endeavor to co-operate with kindred associations in catering—when consistent—to their ideas, and if it is desirable to secure a large display in the horse department, affiliation should be made with the horse breeders' associations; if swine, swine associations, if the fowls or poultry, then to co-operation with their associations. It would doubtless be a profitable result to consult the wants of exhibitors, and a circular asking for suggestions from one year's exhibitors will be sure to elicit valuable information.

#### CIRCULARS.

"Circulars designed to increase exhibits should be made to appear as a personal and an individual solicitation whenever it is possible to do so. In all cases where distributed by mail it would seem to me to be advisable to have them sealed, so as to guarantee that they will be received by the person to whom addressed, as a business man finding a circular sealed as a letter is far more likely to peruse its contents when sent in that form, than he would if received from the mail open to all who may come in contact with it during transmission.

#### BY CO-OPERATION WITH KINDRED ASSOCIATIONS, LIVE STOCK AND INDUSTRIAL SOCIETIES.

By the co-operation with these societies and industries much good may be accomplished, and valuable advertisements of our associations secured if proper attention is devoted to this particular point. Take the State of Illinois, for example; there are associations of cattle breeders, poultry and bee-keepers' societies, horticultural associations, swine and sheep breeders' organisations, &c., &c., formed expressly for the advancement of their several interests. Now, if the secretary of any fair would write to the secretary of any of those associations asking him to prepare a small rubber stamp to read; 'The compliments of the Illinois Poultry Breeders' Association,' with a view of stamping their compliments on postal wrappers and address each wrapper so stamped to members of their association, and then send in each wrapper a copy of the premium list, it would, in my mind, be a valuable advertisement, as the stamping of the wrappers would be an indorsement of that special association and give it the semblance of a poultry breeders' document, equally as much as it would an advertisement of the Fair. The same principle could be applied to all such associations as well as it could be used by enterprising merchants or manufacturers, who would have a local pride and interest in advancing the objects of an association organized and instituted for the purpose of advancing the interests of any particular locality in which the Fair is held; besides, it would insure the circulation of our premium list among people whom we are especially desirous of reaching. For instance, a circular might be issued by agricultural implement dealers, stating that they would have a full line of implements upon exhibition at the Indiana state fair, and enclosing this in a premium list, it could be sent to all their agents. Similar circulars might be issued by commission merchants to their customers, by manufacturers of brick machinery to brick makers, by grocers to their country

customers, and so on through each industry that would be represented at the exhibition.

The circular could be prepared at a nominal cost and, if necessary, at the expense of the association. The stamp of the merchants or manufacturers would be an indorsement of the fair or exposition and have more influence than a list sent from the office of a fair association merely as an advertisement of the exhibition. By this means it would make almost every branch of industry and commerce advertisers of the Fair, and from personal experience, I am led to believe that enterprising merchants and manufacturers would cheerfully co-operate with association in this manner. Having prepared these points from practical experience and principally for the purpose of drawing out the views of all present on the important subject of advertising fairs and expositions, I would respectfully ask a full and impromptu discussion upon the points suggested just as they seem to those whose experience in the matter of advertising has been more extended than my own, as one of my objects is to be benefited by others' experience upon this important part of the duties of a fair official. (sic)

On motion of Mr. Morris R. Locke, of Illinois, seconded by Mr. Robert Mitchell of Indiana, the thanks of the convention were tendered Mr. Wade for the paper and the press of St. Louis were asked to publish it entire.

On motion of Mr. E. A. Barnard, Director of Agriculture, Quebec, Canada, seconded by D. B. Gilliam of Illinois, it was unanimously resolved to ask the agricultural press of the country, to publish the paper, so that it might reach all Fairs and Expositions throughout the United States and Canada.

#### OX WARBLE FLIES.

The valuable lecture on "Æstridæ" or "Bot Flies," given by Miss E. A. Ormerod, hon. consulting entomologist to the Royal Agricultural Society, to the students of the Royal Agricultural College, Cirencester, has now been published in pamphlet form by Messrs. Simpkin, Marshall, and Co., Stationers Hall Court, London. The figures, which by Miss Ormerod's permission we were enabled to reproduce, are copied from the illustrations given by Mr. Bracy Clark, F. L. S., in his essay on "Bots of Horses and other Animals," and they belong to Miss Ormerod.

#### THE WARBLE FLY.

After referring to the Horse Bot Fly, Miss Ormerod passed on to speak of the Warble Fly or Ox Bot Fly here figured.



OX WARBLE FLY.

She said:—The attacks of the Ox Bot Fly or Warble Fly, the *Æstrus (Hypoderma) bovis*, DeGeer, may be taken scientifically as a good example of the division of the Bot Flies that infest the hide. Practically and financially the subject is of enormous importance, not only on account of the suffering and waste of forces of the cattle caused by the attack, but also from the direct loss in value of warbled hides. In a letter (published in December, 1880) by Mr. W. H. Liddell, who is well qualified to express an opinion on this subject, he observes:—"There are at present, I may safely say, three fourths of all our cattle being tortured by this inveterate insect, which, by a little trouble and at a

nominal expense, could be extirpated; and thus we should save an immense amount of capital and wipe out a disgrace to all who neglect their cattle."

#### PREVENTIVE DRESSING

From experiments and information sent in during this year it appears to me that the attack might be put an end to, and any damage to the hide (save what would soon heal durably and reliably) might be escaped by the simple plan of dressing each of these maggot-infested swellings, known as Warbles, with a little mercurial ointment as soon as ever it is perceptible to touch and the opening has formed, thus destroying the maggot within whilst the sore is beginning, instead of after it has been established several months; but it will be desirable to consider the whole of the attack, and especially the reason why the maggot-cavity does not unite thoroughly (even though it apparently heals) if left till February or March.

#### DESCRIPTION OF FLY AND HABITS.

This Ox Bot Fly is about the same size, or rather larger than, the previously-mentioned Bot Fly of the horse. It has a hairy body and large head, with yellow face. The fore body has four raised lines along it, and the abdomen is white or yellowish towards the base, black in the middle, and orange at the end. The legs are black, with red feet, and the wings are brownish and unspotted, and with two large alulets.

The duration of the attack is from one summer to another. It may begin in May or June, or later, according to whether the cattle are in low ground or on hills, and according to other circumstances of weather, &c., but from one summer to another gives the best general idea of its whole duration.

The egg is of an oval shape and white, with a small brownish lump-like appendage at one end. There has been much scientific discussion whether the egg is laid on the cattle or inserted into the skin; it does not seem proved either way; but the most recent observations point to it being placed externally either on the skin or on the hair, and, in the case of the nearly-allied Warble Fly of the reindeer, the female fly has been distinctly seen with the egg at the end of the ovipositor in the act of placing it on the animal. The common idea that the wild gallop of the herd when attack is going on is caused by the intense pain of the hide being pierced is not well founded, for various reasons to be referred to presently.

The warble-maggot, in the early part of its life, is white and transparent and smooth. It makes its way into the lowest part of the skin, and lie there harmlessly until its first moult, when the injurious part of its life begins. Then it gains a skin beset with groups or small bands of excessively minute prickles, and by the pressure of this rough surface irritation and ulceration are caused, and swelling, and the bursting of an orifice in the warble, follows. This is the stage to which I wish more than all others to direct your attention, for, whatever we may do before or after, if we could destroy the maggot at the first bursting of the warble, we should save, I believe I may say all, further trouble and loss.

The grub is then to be found in the state in which it is best known; it lies with the tail-end, which is furnished with two dark horny spiracles or breathing-pores (sometimes mistaken for the head), nearest the opening, so as to enable it to draw in supplies of air. The mouth end, which cannot be called the head, lies towards the bottom of the cell, and when I have held one of these maggots in my hand a regular contraction and expansion of the tubercles by the mouth opening was very noticeable, and as this movement also kept the bunches of prickles near in constant motion, it must have acted as a perpetual irritant in the cavity.

With the growth of the maggot it gains a deeper colour, until it is dark grey or almost black, with the patches of shagreening of minute prickles showing fairly plainly; the sac or cavity enlarges, and towards the May or early summer of the year after the egg was laid, when the maggot is come to its full growth, it presses itself through the opening of the warble, and, falling to the ground, finds some place, as beneath a stone or in the turf, suitable for it to turn to chrysalis in, and there it changes to the perfect fly. Occasionally (though I am not aware the exception has been brought forward before) the change to the chrysalis state takes place in the warble.

#### THE CHRYSALIS.

The chrysalis is dark brown or black, and very much like the maggot in appearance; and, like that of many other kinds of flies, it consists externally merely of the maggot-skin, which has contracted and hardened so as to form a case for the developing fly within. But it differs a little in form from the maggot in being almost flat below.



Chrysalis of Ox Warble Fly, side view, and showing contained Fly

The chrysalis state lasts in common circumstances from 20 to 30 days, but is very much lengthened by cold weather, especially severe night-chills.

#### The Principles of Underdraining.

We give the following brief and condensed hints on underdraining, in answer to frequent inquiries, or to correct erroneous published statements:

1. The first thing is to ascertain the natural descent of the ground, and this the owner who has occupied the farm for some years, knows tolerably well by the flow of surface streams. The use of a simple level, made by carefully fixing

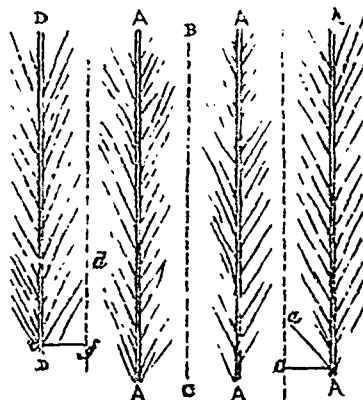


Fig 1

a carpenter's spirit level to a straight five-foot rod, will assist him.

2. If the land slopes evenly, the drains, about two rods

apart, may run straight down, and nearly parallel. (1) They should never run obliquely down. Fig. 1 shows how ditches from the high side of the field at B, directly down to C, drain the land on both sides (the double lines representing the ditches), the water soaking obliquely from the dotted line on each side in the direction of a to b, or of d to e, into the drains. Fig. 2 represents oblique drains, taking the water

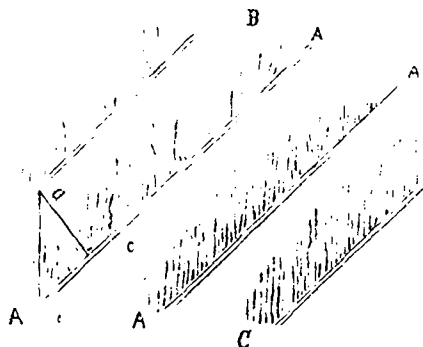


Fig. 2.

only on the upper side, or from B to C, conveying it more slowly and often leaking out sidewise from the bottoms, as shown in fig. 3.



Fig. 3.

3. On uneven land, or with knolls and hollows, as shown in fig. 4, place the drains in the hollows, so as to run in the direction shown by the arrow. If the side hills need more draining, branches may be cut running into these bottom or main drains, fig. 5.

4. The size of the pipe-tile to lay in the ditches must vary with the slope of the land and the amount of surface to be drained; and they must be larger, if they are to carry off the water of springs than mere rainfall or melting snow. A few examples will assist the farmer in judging approximately

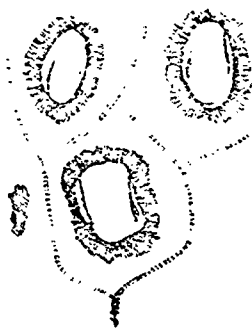


Fig. 4.

How large the tile should be. A pipe tile of two inches bore will carry off the surplus water in an acre of soil, in from twenty-four to forty-eight hours, with a descent of one foot

(1) Quite parallel, unless impossible

A. R. J. F.

in twenty; the acre being equal to a strip of land two rods wide and eighty rods long, with the ditch in the centre. With a descent of one foot in a hundred, it will require rather more than twice as much time. As a general rule, water will

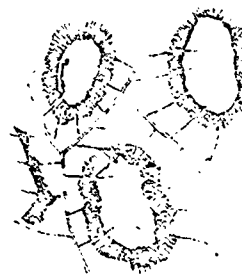


Fig. 5.

run off in pipe-tile over three times as fast with a descent of one foot in ten as one foot in a hundred. A four-inch pipe will convey water six times as fast as a two-inch pipe. These facts will assist in deciding how large the tile should be for drains of different lengths, or for main drains which receive several smaller ones. (1)

5. Ditches should never be less than two and a half feet deep in the hardest ground, and three feet is better. (2) They will vary somewhat with unevenness of surface.

6. There must be a constant descent of the bottom, which may be graded by the use of the simple instrument shown in fig. 6, the two legs of which are set in the bottom of the ditch

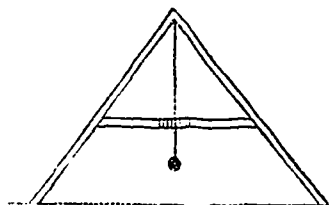


Fig. 6.

and if the plumb always hangs nearest to the lower side, the ditch has a constant descent.

There are several other general rules and directions which should be observed for draining land, namely:

1. To ascertain where draining is needed, dig holes here and there, three feet deep, and if water remains some days in them during a wet time, the land needs draining, no matter how dry the surface appears to be.

2. A good outlet must be always provided, and this should be protected from the entrance of mice with an iron grate, or with a mass of fine or broken stone which they cannot pass.

3. Branches should enter mains, and drains enter streams in nearly the direction of the current, to prevent obstruction, and short curves should be avoided.

4. Drains near trees of hedge-rows should have the entrance of future roots prevented by close fitting caps or collars at the joints. (3)

(1) Inch and a quarter pipes are quite large enough. All our pipes here weigh twice as much as necessary. A. R. J. F.

(2) At 2 rods apart, 30 inch drains would do but little good. Four feet, at that distance, is not too much. A. R. J. F.

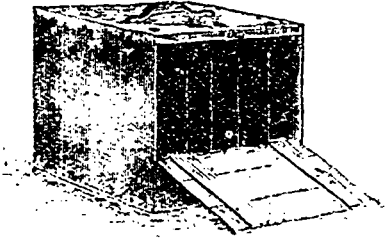
(3) Useless expenditure, for the roots will get in if a hole as fine as a pinhole is left. A. R. J. F.

## SETTING HENS.

## SELECTING BROODERS—A HATCHING BOX

*Eds. Country Gentleman*—To nearly all poultry keepers, whether farmers or not, the question of the greatest importance in the early spring is the procuring of eggs for hatching, the obtaining of brooders to sit on them, and their care during the process of incubation, and a few words as to the management of sitting hens will probably be acceptable.

When broody hens are scarce it is often necessary to take the first one that comes to hand, but this is not always a satisfactory method; and it is better, whenever possible, to consider the disposition and trustworthiness of the hen to which valuable eggs are to be given. Still when time is precious and hens are not to be had very easily, some risk may be taken. But I have generally found it better to wait a few days longer for a trusty sitter, than commit the care of eggs to a hen which, though broody at the time, is not of a breed regarded as good for maternal duties. It often happens that broody hens which have to be sought for are mongrels, with no very defined characteristics, but very little experience will enable any one to tell whether a hen is likely to prove a good mother or not. In the first place, all feather-legged birds may be depended upon in this way, but if heavily feathered and clumsy in build, there is another danger, namely, that the eggs or chickens may be crushed through the awkwardness of the mother. Often have my plans been frustrated and temper ruffled by Cochins and Brahmas in this way, and thus I do not care to give eggs—pullet's egg



at any rate—to pure bred birds of either of these breeds. Early in the year the majority of eggs will be laid by pullets, and as in these the shells are generally much thinner and weaker than those laid by hens, this must be taken into account. But half bred birds, such as Brahma-Dorkings, or Cochin Dorkings, can be used with safety, and the first named I prefer before any pure or cross breed as sitters and mothers. They are large and can cover a goodly number of eggs, are careful but not clumsy, will fight in defence of their broods if needs be, and yet allow an attendant they know to handle them. Many poultry keepers in this country keep a number of these birds for hatching and rearing, and during the season they are in constant demand, as much as a dollar or even a dollar and twenty-five cents often being given for a two-year-old Brahma-Dorking.

Next to these I place the game fowls. Nearly all birds with game blood in them make good sitters and mothers. Pure bred game fowls may be employed, and where kept for other purposes can be used for this, but I should not advise that they be bought expressly for the purpose, as they are small in size and cover but a few eggs. They are very pugnacious, fighting almost any one who comes near to them. If two game hens are sitting in one place, and they get out together, there will be a battle royal, which may be interesting to witness and enjoyable to the combatants, but does not conduce to successful hatching. And also, as I always prefer to set the hens in boxes, which for convenience sake are all kept in one room, game fowls are difficult to manage, and are apt to be

very awkward. Half-bred game are much better, and thus Game-Dorking, Game-Brahma, Game-Cochin, or any other similar cross will be found very good indeed for the purpose.

Amongst pure bred fowls other than I have mentioned, the following list may be taken as a pretty complete one—Plymouth Rocks, Dominiques, Langshans, Scotch Greys and Silkies. The last named are very small birds and can only cover a very few eggs, but they make excellent mothers, and are very largely used by English bantam breeders. They can be taken when others are not available. I have not had myself any experience with Wyandottes, but have been told by an importer of these fowls that they make very careful sitters and mothers. I have mentioned all these pure-bred fowls, for sometimes it is possible to hire birds as sitters for a few weeks. This I have often done with advantage, both to the owners of the birds and myself. He has got rid of surplus brooders, and I have obtained just what I required when my own birds were not available. And it is generally beneficial to a hen to allow her to sit when she desires to do so, in order to give her a rest from laying; this loaning system can easily be adopted, especially by friends and neighbors.

In "Profitable Poultry-Keeping," I have given a brief description, with illustration, of a hatching box, such as I have myself used for many years. This is a box without bottom, and for ordinary sized fowls, about 15 inches square and 10 or 20 inches high. It is made of half or three-quarter-inch boards, and is solid, back, sides and top, save for the ventilating holes. Part of the front forms the door. This door is the width of the box, and 15 inches high. A piece of deal three inches in depth forms the lower section of this front, and a similar piece two inches in depth the upper, the door piece occupying the space between. At first I hinged the door, so as to open upward, but I prefer now to have it hinged to the lower section, and to open downward. It then forms a firm footing for the hen entering or leaving the nest, and prevents any accidents from the closing of the door unexpectedly while the hen is off, as it is not always possible to wait until a hen goes on again. I have at times found a hen shut from her nest for an hour or two, and this has led me to adopt the downward opening of the door. A button fitted on to the upper section of the front, and the door hinged to the lower section, completes that. In some sitting boxes I have seen this door a wooden frame with wire netting stretched over it, and it is one of this kind that is shown in my book, but I prefer the door solid, as then the inmate is entirely in the dark, and cannot be disturbed by the sight of other hens. Where rats are troublesome, it is a good plan to put some stout half-inch mesh wire netting over the open bottom. A handle on the top, as shown in the illustration, facilitates removal. Three ventilation holes in each of the sides and back, and half a dozen in the top, completes the box, and when it is well whitewashed, it is ready for use. I have sometimes made one in an hour, and at one time always put together my own.

The advantage of a box like this over the ordinary method is very great. I have kept as many as twenty hens in a room at one time, all upon batches of eggs, and how I should have managed if separate places had had to be provided, I cannot say. The boxes were placed about a foot from the wall, with their backs to it, and about a foot from each other. Each hen was allowed out from ten minutes to half an hour every day, and by an arrangement of movable wooden frame and wire netting screens or runs, four could be out at one time without disturbing or interfering with each other. Thus the youth who was in special charge of the poultry could, by visiting the hatching room every now and again, give the needed attention to the sitting hens without interfering with his other duties.

'STEPHEN BEALE'



## THE GRAZIER AND BREEDER.

## BREEDS OF BRITISH SHEEP—XI.

*Shropshire-Downs.*

Residents of the Eastern States of America who travel in the rural districts of England are often struck by the sparseness of the population. For a century past, the people have more and more collected into the towns. The growing importance of the manufacturing interests has drawn constantly increasing numbers into the workshops. Beside this, changes have taken place in agricultural methods, so that a greater profit is found in large farms, and, hence, the smaller ones have been united and the number of farmers reduced. In addition to these changes in pieces of residence and in occupation, the continuance of an old custom of retaining tracts called "commons," belonging in most cases to the parish, and free for all to pasture animals upon them, helps to make the country in some sections almost uninhabited, and quite given up to the flocks and herds that feed upon it. The amount of land still remaining in commons is surprising. Such was in the past and, to a considerable extent, still is, part of the county of Salop. (1) The Morfe and Long Mynd commons were of vast extent, and carried very large numbers of their own native sheep, which were in no wise remarkable, except for their unusual healthfulness. The same breed also occupied the 25,000 acres of Cannock Chase, in Staffordshire, on the east. They undoubtedly were a good strong foundation to improve upon. As farming operations advanced, and root and other feeding crops were grown, and as the commons were gradually enclosed and cultivated, this native sheep could not so quickly respond to better feeding as was desirable, and therefore recourse was had to other breeds for their improvement. Leicesters, Cotswolds and South-Downs were all used, it is impossible now to learn in what relative proportions. Of course these various crosses produced very different animals, and for a considerable time the flocks of Shropshire were as unlike each other as well could be. But gradually intelligent breeders fixed the type that seemed most desirable, and, by careful selection from these cross-bred animals, slowly established a breed that, while not yet so uniform in character as is desirable, stands very high in the public estimation, and is increasing so greatly in numbers as to be found monopolising lands far away from home. In the fertile valleys of Wales on the west, on the rich dairy lands of Cheshire to the north, and elsewhere so far away as Yorkshire, great numbers of them are to be seen. In Shropshire itself they are very numerous alike in the hilly portions of the south and west, the level lands of the north, and the rich meadows along the Severn. They appear likely to monopolize the western central portion of the country. Their popularity in their home-county was well illustrated at this season's Royal Show at Shrewsbury, where the number on exhibition was greatly in excess of all other breeds, as was noticed soon after in the COUNTRY GENTLEMAN.

The formation of the Shropshire breed began so recently as about fifty years ago, although cross breeding was practised long before. It was recognized by the Royal Agricultural Society some twenty years since. The sheep of the commons were horned, and had black faces and legs, dressed from fifty to sixty pounds of meat, and sheared two or three pounds of moderately fine wool. Now they are without horns, and have gray faces like the modern South-Downs. An effort is made by the English breeders to retain the dark faces which the Leicester and Cotswold blood have tended to destroy. The head is well shaped, the ears are large but well set on the head, and the neck is quite meaty. The back is straight and good, the breast broad and deep, the shoulders are massive, and the ribs are well developed. Fat wethers have dressed

(1) Salop: Shropshire.

250 pounds. They do not mature so rapidly as such long wools as the Leicesters and Cotswolds, but their flesh is of decidedly better quality. They sometimes take prizes over the Hampshire-Downs as old sheep, but in their turn are beaten by them in the younger classes. Their wool is shorter than the Oxfordshire-Downs, not showing so much of the Cotswold character, and is longer than that of the Hampshire. It weighs seven or eight pounds to the fleece. The ewes are very prolific, and are excellent mothers.

From what I have seen of the Shropshire Downs, I believe them to be a very valuable breed, and suited to extensive use in America. They are strong, hardy sheep, of good size, but not too large, and give meat that will decidedly raise the mutton standard in our markets. They do not go to pieces on short pasture, while they stand high feeding well. In their home district they are kept more upon grass than are the larger breeds in theirs, except perhaps the Lincoln. Elsewhere they are mainly kept upon cultivated crops.

In speaking of English sheep-husbandry, reference is so frequently made to cultivated crops that it may be well here to state how sheep are carried through the year upon them. In April the new feed begins, and then the mangolds, carried through the winter, are helped out by winter oats, rye and some of the earliest clovers. In May the different clovers and vetches are depended upon, and the same are used in June and July. In August, cabbages are added to these. In September cabbages and rape are the main reliance. In October the early turnips are ready, and in some sections mustard (1) is much used. During November turnips are more heavily fed. In the three winter months, turnips and swedes are the stand-bys, and in March mangolds are begun upon. Of course during all the year such grasses as the farms afford, and, in the winter, hay, straw, cake and grain are used. These green crops are nearly always fed upon the ground where grown, movable hurdles being used to enclose such portions as the flock will daily consume. If the sheep are being fattened, they are moved a little faster than this, and store sheep clean up the food left behind them. While the lambs are with the ewes, they are allowed to run through "creeps" in the hurdles, and to pick such food as they may fancy in the yet untouched crop.

They have many kinds of clovers and leguminous plants we never see in America. We should be fortunate if some of them were better suited to our soils and climate. A field of crimson clover—*Trifolium incarnatum* (2)—in full bloom is very beautiful, as also is the much grown, lighter colored sainfoin—*Onobrychis sativa*. The lupins and vetches also grace their utility with beauty. (3) JAMES WOOD.

Mt. Kisco, N. Y.

## Cutting and Planting Potatoes.

An immense amount of work is involved in properly planting a large area in potatoes. I do not wonder that in the hurry of the planting season so much of it is carelessly or mistakenly done. Even the cutting of the seed, if done as it should be, requires a number of days of slow, dirty and disagreeable work. I set out with the idea that this year I would cut all my seed potatoes myself, and according to the plan recommended by Dr. Sturtevant—single eyes cut deeply. But I find it very difficult to cut the single eyes without getting the pieces smaller than I like to risk at one set in a hill. I have finally concluded to plant some in that way and mark the places, while the remainder will be planted two eyes in

(1) Mustard is used only for the ewes and non-fattening sheep.

A. R. J. F.

(2) Would not answer here. The frost would destroy it. Sainfoin wants a chalk sub-soil.

A. R. J. F.

(3) How sincerely I apologise for having omitted this description of the second best breed of English sheep! A. R. J. F.

a hill, and a good many of the sets out to two or three eyes and one piece in a place. As I make the hill three feet apart each way, a failure of a hill makes a considerable gap. Rainy weather coming on, I set my hired men at work, giving them instructions to cut as nearly in the prescribed way as possible. As a result, I am getting two, and sometimes three good eyes on a set, and all of these I shall plant with only one piece in a place. But I do insist, and this point I think is gained, that the eyes shall all be cut deeply towards the stem end. I do not roll in plaster this year, as I doubt whether there is any advantage in it while the weather is so moist as it has been the last two weeks. In a very dry time plaster is sometimes helpful; but I do not apply it to cut potatoes for the purpose of drying up the juices. I want to have them partially dried at least before planting, and this is the best done by spreading thinly on racks with slats, which in the fall are used for drying apples. A few hours' drying on this fits them to spread on the floor in the barns, but still thinly so as not to endanger heating.

Is land plaster of any use in the soil, or on its bare surface? I have found it helpful dusted on the leaves of potatoes as soon as the plants are up, but what falls on the soil is, I think, wasted. (1) It has little or no manurial value on my land, for it already contains enough lime; but it does, under favorable conditions, stimulate the growth of leaves. This, with potatoes, is what we first seek. It is very rare that a strong, stocky growth of potato vines is not accompanied by a good crop of the tubers; hence I use plaster on potatoes before the vines are large enough to bear a dose of Paris green. In this way the leaves get two and sometimes three dustings with plaster, but I believe each one helps the crop more than the cost of labor, plaster and poison combined.

Owing in part to the rainy weather the latter part of May, I am planting potatoes this year later than ever before; so also are the farmers in this neighborhood. I do not regard this as any disadvantage. Despite the severe drouth late in the season last year, the best potatoes in the neighborhood were planted June 17th, and in another town a large crop was grown planted June 22d. It is impossible to get potatoes started early enough so that the crop will form before the hottest weather of midsummer, and as the potato loves cool, moist weather, the better way is to have the tubers form after most of the hot weather has passed. Either very early or very late is, I think, better than the medium time in which the bulk of the potato crop is planted. This year, in Western New-York, heavy rains fell at the time when most farmers want to have their potatoes planted, and all will be put in later than usual.

The chief and only difficulty in late planting is in keeping the seed potatoes in good condition. If left in the cellar until sprouts are a foot long, it is almost impossible to get a good crop. It is no trouble to keep potatoes even to the first of July in good planting order. All that is needed is to keep them in a light, dry place, spread thinly and turned occasionally. If the early varieties are thus kept late, they will have strong, vigorous eyes, and may be planted as late as the 4th of July, on rich soil, and make a good crop. In this later planting the seed will need to be put down more deeply than earlier in the season—not less than four inches deep, and five inches on most soils would be still better. But if the germ of the eye has been exhausted by repeated sprouting, it matters not how early they are planted the crop will be a failure. Potatoes are best kept through the winter at a temperature not much if any, above forty degrees.

W. J. F.

Monroe County, N. Y.

(1) Plaster can act on any plant through its roots. I doubt its use for potatoes except where lime is absent. It is the dominant manure for pod-bearing plants.

A R J F

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