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## OFFICIAL PART.

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### DE OMNIBUS REBUS.

July 1st, 1888.

**Small vs. large cows.**—A correspondent, who has devoted much time and study to the investigation of this question, says, in a note on some observations of mine in the *Journal*: “The smaller the animal, the more food per cent of live weight required to sustain life, but also, the greater effort made to digest similar food and to turn it into satisfactory use. However, butter being mostly carbon, is it not possible that the active, nervous little *mother* will secure more of that from the same quantity of life sustaining food?” From the same, on “Contests of Dairy-cattle”: The true difficulty in such competitions is the proof of a given total quantity of milk

of a given quality in the year, with the total quantity of elements of food required to produce such equally rich milk. Competitions, therefore, can only be valuable where the animals can be compared for a lengthened period.”

*The Guénon theory*, my friend says, is by no means exploded. “I have never seen a really good milch-cow without a good escutcheon. All admit that there must be room for the udder, and breadth behind, and when these are found they are always accompanied by a good escutcheon; at least, it strikes me so.”

*Butter-fat in milk.*—Again, on this subject: “What seems to vary in milk is butter-fat alone. All the analyses I have observed—I am not always a good observer—show about the same per centage of casein and sugar, taking the year round. But the fat varies from 2%, to even 13% in those exceptional butter producers whose records we see in the papers. If this be so, is not butter-fat the true point of comparison on the one side, and the quantity of food required to produce it on the other.” This latter point is almost always overlooked, but wrongly so.”

*General-purpose cow.*—“Where, oh, where is the general purpose cow?” asks our correspondent; “It strikes me very forcibly that we have three varieties of *special* purpose cows and nothing else.” My answer to this question is, that you import Jerseys, Kyles, Sussex, and even Dexter-Kerries, but you will not import the English farmer’s general-purpose cow, the unpedigreed milking Shorthorn. Until you do this, you will never know what the general-purpose cow really is. I see the price of the best strains of this breed is going up daily. They are not fit for *Sorel sands*, but in the Eastern Townships the land is almost every where good enough for them.”

*Maize.*—“It seems well established, that between the

*silking and glazing of Indian corn*—the solids are just doubled. Moreover, that the amount of solids depends on the more or less formation of grain in the cobs. If this be so, the plant must be fed, in full, and phosphoric acid is indispensable as well as potash—besides nitrogen." True, of course, but I fancy on the light soil my correspondent is cultivating, though potash is probably wanting, the plant, when kept stirred by the harrows and horse hoe as his practice is, will find plenty of phosphoric acid for itself from the soil.

*Siloes.*—A neighbouring farmer is about to build a silo, but he has a difficulty; the principal range of buildings were, most injudiciously, laid out on a spot where any excavation would be deeply flooded every spring. He, therefore, proposes to build the silo at a distance of some 70 or 80 yards from the cow-house, and I wrote to a friend of mine, who has had a silo at work for some years, for his opinion on the subject: "A silo 75 yards from the barn would lose most of its advantages. If D. is afraid of *smells*, I can tell him that people constantly pass along my siloes *in the barn*, between the stables and actually touching the butter-factory, and, unless they were told, they would have no idea of the proximity of the siloes. But we make only *sweet silage*. As to what you say about drying and stacking fodder-corn, I never could dry the stalks sufficiently not to heat in the stack before winter. I have grown maize for years, and even when the stalks remain in the field until hard frosts set in, the stack then built is apt to heat, and considerably too, if the cold is not continuous. Remember, we are not in the State of New-York, or South of it. To my mind the silo has one main advantage: it keeps in a green state fodder which could not be easily saved otherwise. Now, as to green stalks, as compared with dry, do you not admit that dry hay—no matter how well made—never produces the same amount of meat, milk, or wool, which would have been produced by the green grass or other green food—tars, &c.—from which the hay was made?"

I certainly admit the last position in its entirety, because I believe that something more than water escapes from the hay in the making, just as I believe that many of the valuable parts of the malt and hops escape from the brewer's worts while they are boiling and cooling; else, why the odorous exhalations we all recognise as we pass on the leeward side of a brewery in operation? But I do not think that a moderate degree of heat would injure a stack of *well-won* fodder-corn, such as I used to see in the Eastern Townships some fifteen years ago, particularly if trestles, or what the Scotch call—well, I have forgotten the name—be placed under them, extending from each side to the middle, and an upright triangular or circular open frame of rough pales, meeting them at their junction, go right through the roof. The trestle is made of some rough stuff, in any farm, and about three feet high. I have seen pease, carried and stacked in a very green state, keep well under this style of treatment, and I think it would answer for corn. Our S. E. of England hay-stacks heat so that an unaccustomed visitor would think they were on the point of catching fire; but they are all the better for it.

*Fermenting food for cattle.*—In 1872 Mr. Cochrane, of Hillhurst, was in the habit, of feeding all his cows on hay-chaff, meal, and ground turnips, thrown into a conical heap together, and allowed to ferment for 24 hours. In the spring of the following year, a great number of his cows aborted, and others dropped weak, sickly calves. His son, Mr. James Cochrane, subsequently passed a year or so in England, and on his return he told me that he had stopped the system of allowing the food to heat, as he, agreeing with what I had said before he left for his voyage, believed that the numerous abortions in the herd were principally attributable to the pre-

paration of the food in the way I have mentioned. I see by a late issue of the Agricultural Gazette that other people share my belief in this matter. Mr. Livesey, who has a model farm at work in Sussex, England, was visited last month by a large committee of *agronomes*, who inspected his farm and stock, and expressed themselves as being well satisfied with the whole management of the business. A steaming apparatus is provided, but it is now never used, as Mr. Livesey believes in giving food in its natural state as much as possible. Therefore linseed is made into meal and mixed with the chaffed fodder. *Speaking of abortion*, he said that he had given up steaming food, had had the place thoroughly disinfected with sulphur, and had never had it—abortion—since.

*Ensilage.*—"As Western, or rather Southern, corn for ensilage contains at best only from 12% of solid matters, it must be pretty clear that the thick wating stuff produced in this province from such immature fodder is not likely to contain more than from 5% to 8% of solids, while it is proved that our own Canadian corn, when nearly ripe, contains as much as 26%." E. A. B.

*Roots vs. grain for milch-cows.*—Mr. Brown, the professor of agriculture at the Guelph college, is, like me, a great admirer of the cultivation of roots, and no wonder, for we have both had the misfortune (?) of being born and brought up in Britain. Last winter an experiment was tried under Mr. Brown's superintendence to test the relative value of roots and grain in the production of butter, the following objects being aimed at: 1. the cheaper production of winter-milk; 2. to get milk equal at least to the average Ontario summer milk; 3. the use of a large quantity of roots without the butter having a bad flavour; 4. to maintain a good flow of milk without the use of grain.

The daily rations were thus composed:

ROOT RATION.			
Chaffed hay - timothy and clover.	Mangels.	Swedes.	Belgian carrots.
12 lbs.	33 lbs.	33 lbs.	15 lbs.
GROUND GRAIN RATION.			
Hay.	Oats.	Pease.	Barley.
12 lbs.	7 lbs.	7 lbs.	7 lbs.

Taking two cows which had been tested over a winter of 180 days, one on each of these rations, and all other conditions being equal, the following comparison was obtained:

Milk in lbs.	Value of milk.	Cost of food.	Manure value.	Net gain.
Roots. 3762	\$47	\$35	\$ 7	\$19
Grain. 4020	50	56	16	10

Now this is very striking! A ration containing 21 lbs. of mixed grain beaten by a ration containing 75 lbs. of mixed roots by nearly 100%! M. Bernatchez, in the "Preliminary Report of the Agricultural Commission of the Province of Quebec," a copy of which has just reached me, attributes the superiority of the cultivation of the Ontario province in great measure to the quantity of root-crops there grown, and he strongly recommends the farmers of Quebec to increase their acreage of these valuable plants. I need hardly say that I agree with him. Still, without an experiment—in fact, without many experiments—I should not have been prepared for such a difference in favour of the roots as is brought out in the above experiment. The professor, very sensibly, adds: "The dairy world has yet to learn whether the extensive use of grain is or is not economically correct; whether a large

quantity of roots with hay-fodder is both safe and economical for milch-cows; and whether the animals are in better health with root rations than with grain. Remembering at the same time that we have to await further tests, as this is our first systematically conducted one." The root-milk was slightly inferior in quality to the grain-milk, but that was to be expected. I should like to see the experiment tried over again with the substitution of two pounds of crushed and scalded linseed for five pounds of the mixed grain.

ARTHUR R. JENNER FUST.

### The Agricultural Commission.

The members of the above commission have presented their report to the Lieutenant Governor of the province, and I presume we shall soon see some fruits produced by it. Their opinion seems to be that no good, or at least very little, has been done up to the present time by the agricultural colleges, now existing, though they kindly attribute their failure more to an in-efficiency of means than to a want of knowledge. The school at Ste-Anne de la Pocatière seems to be, as far as profitable exploitation goes, in a most flourishing condition, as the profits made in the year 1886 amounted to \$1,500, though the expenses embraced the interest on the cost of the farm-buildings, and  $2\frac{1}{2}\%$  on that capital for repairs. The land is rented, so of course the rent is charged. This is really wonderful, and I am not surprised to hear that "under pretence that the pupils would waste the labourers' time, or injure the implements, they are excluded from a great part—the most important part—of the operations of husbandry; they are only allowed to dig potatoes, and do other trivial things of that sort." It would be no trifling misery to a genuine farm-manager to see good work spoiled by the meddling of a few boys who have not yet learned to handle their tools. The way would be to give up ten or twelve acres of land as a practice-ground for them, and let them plough and work it until the farm-manager was satisfied that they were capable of doing the regular work of the farm with skill and accuracy.

As for the general complaint that the school-farms do not show a profit, I can only repeat what I have said before that it is the most unreasonable thing to expect such a thing. The best processes can be shown in operation on school-farms, but not the most economical way of conducting them.

The stock kept on the L'Assomption farm is said to be  $4\frac{1}{2}$  head per arpent! What can this mean? Perhaps it means  $4\frac{1}{2}$  arpents to each head, which I take to be more like the truth. On both these farms—Ste-Anne's and L'Assomption—the rotation is one of 10 years: 1st, *meslin*, i. e., oats and wheat; 2nd, roots and tares, heavily manured; 3rd, wheat with grass-seeds to lie out seven years. (1)

The farm-school in connection with the College of St-Francois at Richmond seems not to have given much satisfaction to the commission. The fences are said to have been in bad order, and the general cultivation not what was to be expected at a farm of this kind. Besides meadows, there were only a few acres of barley- and oat-stubble, showing that hardly any grain was grown. Root-crop, except potatoes, very poor.

The creamery at Richmond was the best thing about the place; there was not a pupil to be seen; and there were, apparently, no books kept. (2)

(1) The word I have translated *meslin* is printed in the report *goudriole* for *goudriole*. I need not say that the former of these two words does not convey a very charming idea. At Chambly, it is called *goubourage*—neither word is in the dictionaries. *Meslin* is a Yorkshire word, through originally French.

(2) There are said to be seven pupils.

A. R. J. F.  
A. R. J. F.

The whole number of pupils on the three school-farms is 27, and as the grant to the colleges is \$8,800 a year, the cost of each boy amounts to \$320 a year! And worse still is to come: as only about 20 of these become farmers after leaving, each farmer reared and trained in these schools costs the country \$140 a year during his term of residence. At Guelph, the cost of each pupil is only \$184 a year "which is an excellent thing"!

The following is a condensation of the general remarks on the schools by the commissioners: The instruction, both theoretical and practical, given in the schools is far from being what it ought to be. The theoretical course is at most an elementary one, and it is probably on that account that our young men avoid these schools, a fact which is shown to be true by their only having at most thirty pupils, while Guelph has about a hundred.

The professoriat, the implements, and the stock, are not up to the mark. It is admitted that the principal aim of agriculture in the province should be the rearing of cattle for meat and dairy-production. Now, no one can be a successful breeder of stock without of a fair knowledge of veterinary science and of the practice of dissection, and neither of these branches is taught in the schools to any useful extent, as may be easily understood when we consider that the salary of the professor of veterinary surgery is SIXTY DOLLARS A YEAR!

There are no museums or apparatus for the practical demonstration of the teachings or of the lectures of the professor, except at Ste-Anne's, and the apparatus there on view is not of much account.

Another great defect is that the farms connected with the schools are not the property of the schools: at Ste-Anne's and L'Assomption, they belong to the colleges at those places, and at Richmond, the farm belongs to a company which uses it as a matter of money-making. The proprietors naturally try to make all the profit possible out of the farms, and when their object comes into competition with the teaching of the pupils, the latter go to the wall. The proprietors will not risk any innovation, neither will they spend any money, however necessary the outlay may be for the completion of the practical course of instruction.

The management and feeding of the different breeds of cattle are not identical. If the cattle kept on the school-farm are all of the same breed, the pupils cannot possibly be taught, as they ought to be, how to feed and manage different breeds.

The lads, when they enter, are too frequently almost entirely ignorant of the ordinary rudiments of education, barring reading and writing.

In spite of what has been said, the commission believes that the connexion existing between the agricultural schools and the classical colleges inspires the farm-pupils with a feeling of contempt for their future business. In other words, the pupils of the classical colleges treat the farm-pupils with considerable hauteur.

The experimental part of the practical course is neglected. A complete course of instruction in agriculture should embrace the cultivation of all the crops that can be grown in the province, and unless the pupils have an opportunity of seeing this carried out, no surprise can be felt if, after their course is completed, they, on embarking in business on their own account, become just as much the slaves of routine as their forefathers.

In two of the colleges, Ste-Anne's and L'Assomption, there is neither a creamery nor a cheese-factory. Lectures are given on dairy-work, it is true, but what good can they do without practical teaching? It is clear that pupils leave the schools knowing no more about dairy work than they would have picked up by reading a printed treatise on the subject. At the same time, it should be noted that a special grant has

been made to these schools for the purpose of establishing creameries or cheese-factories, but the managers have not thought it worth their while to avail themselves of it.

The professors of the three colleges are in number twenty-one—almost a professor to each pupil! Their pay amounts, annually, to \$4,880.00—about \$180.00 for each pupil! It is clear that the staff of one of the three schools could easily give instruction to the twenty or thirty pupils who attend them.

*Reforms.*—One of the two schools of veterinary surgery to be attached to a school of agriculture. It is evident that no good teaching can be expected from a professor of veterinary surgery at \$60.00 a year!

To each school must be attached a creamery or a cheese-factory. The absence of either one or the other of these at Ste-Anne's and at L'Assomption, is inexplicable and very much to be condemned.

The practical teaching of the two arts of butter- and cheese-making would throw open to the pupils on leaving school a trade which would be most useful to them in after life.

The schools should refuse matriculation to all candidates for admission who have not received the elementary instruction requisite to enable them to follow the course with profit.

A short treatise on agriculture should be studied by, and explained to, all the pupils of the country schools.

The system regulating the admission of pupils should be entirely changed. The parent or guardian of each lad should sign an agreement, covenanting to repay to the government the cost of board and teaching in case that, when his time expires, the pupil shall not betake himself to the practice of farming; unless he shall be prevented by ill-health.

*Plans for the future.*—The commission recommends that: 1. A single school shall be established, at the cost of government, for the whole province, supplied with a laboratory, museum, &c.; 2. the school to be independent of all other teaching bodies, and under the sole control of the minister of agriculture; 3. a complete staff of professors shall be appointed; 4. the course to be one of three years and no pupil less than sixteen years of age to be admitted; 5. a farm to be annexed to the school and divided into two parts, one for ordinary farming, the other for experimental work; 6. a dairy to be added for the sake of practical instruction to the pupils in both butter- and cheese-making; 7. one of the veterinary colleges to be attached to the school; (1) 8. the situation of the school, if possible, to be at a distance from large towns, and to represent, as nearly as possible, the average climatic conditions of the province; 9. a grant to be made by government, sufficient to insure the proper discharge of the duties of the establishment; 10. the Journals of Agriculture to be edited by the professors of the school; 11. land-grants to be made to successful pupils; 12. licenses to practice to be given to pupils who have passed, by the professor of veterinary surgery.

Instead of the present Council of Agriculture, the commissioners recommend that a commission be formed composed of the Minister of Agriculture, president *ex officio*, and ten members, at most, of the committee on agriculture of the legislative assembly, chosen from those members of the house who possess a practical knowledge of agriculture; and of five others, named by the Lieut. Governor in Council, at the recommendation of the commissioner of agriculture. All the funds and powers now possessed by the council of agriculture to be handed over to the new commission.

The agricultural clubs to be aided in the extension of their

(1) If the school is to be established in a country place, I do not see how sufficient practical work for the veterinary students can be secured; v. art. 8.

action by government. Agricultural industries, such as the cultivation of flax, starch, superphosphate, wood-pulp, &c., to be assisted and encouraged, as well as the manufacture of wine from the native or wild grape of the province, the cultivation of fruit trees, and the production of beet-root sugar, the latter by the premium of fifty cents a ton on all the beets delivered at the factory at Berthier, the only one now at work in the province.

A minister of agriculture and colonisation to be appointed; the said minister to be a practical farmer.

Letters from divers quarters follow, but they are too long to be quoted.

ARTHUR R. JENNER FUST.

*Agricultural panaceas.*—A friend of mine was asked, the other day, why he, who was such a thorough-going liberal in politics, was so complete a conservative in agricultural matters. His reply was to this effect: I am not a young man, and, if you will allow me to say so, I have not kept my eyes and ears closed during the forty odd years I have been, more or less, engaged in agricultural pursuits. I have seen all sorts of panaceas brought forward, and recommended to the farmers as cure-alls of their so constantly recurring troubles. Bokhara clover was introduced into England, about the year 1835, as a plant that would grow about eight feet high, and produce enormous crops with a very trifling dose of manure. Then came "Gold of Pleasure," the yield of which was to be about sixty bushels an acre, and the seed was to make good beef for three pence a pound! Black barley, and nursery-wheat were to do wonders, and beans with turnips between the rows, were to produce a double crop, which, for some unexplained reason, was to exceed the yield of the two on separate pieces of land of the same extent as that occupied by the double crop. Pig-feeding, again was in extraordinary vogue in 1852. A friend of mine, who farmed some 800 acres of thin, poor chalk near Brighton, was so impressed with the idea that this was the real royal road to wealth, that he, for three years, bought on an average some 400 pigs, and fattened them on purchased food. At the end of that term, he gave up the business, as he found it to be an unprofitable one. At Sir Humphrey de Trafford's, in Lancashire, poles, on the tops of which run electric wires, were erected at a vast expense, and stood for two years, as may be seen more fully described in the Journal of the R. A. Society of England, about the year 1849. Flax and beet-root sugar were to make the futures of all the East Anglian counties; but they did not! And so the play went on. The few tenant-farmers who were induced by their landlords and their agents to embark in these wild schemes soon gave them up, and returned to the good, well tried system of producing a fair varieties of the different agricultural crops which form the main dependance of a regular agricultural exploitation.

*Lachine farms.*—M. Daigneault's farm, which he rents from M. Boyer, M. P. P., is beautifully situated, and, at present, affords a lively picture owing to the vast quantity of charlock, cadluck, or 'kilk—i. e., wild mustard—which adorns the lower twenty acres. The queerest thing is that M. Daigneault makes money by his farm, though it is, on the whole, about as badly cultivated as any in the province!

*Hops.*—These do not get the cultivation they need here. The horse-hoe can only go up and down between the rows of hills, instead of having at least two paths, or four when planted *quincunx* fashion, as all hops ought to be. In consequence of this error in setting out the hills, the land is not stirred near enough to the plants; the roots are confined to a very small space; and the growth is restricted, as may well be imagined. A couple of furrows in the middle of the alleys,

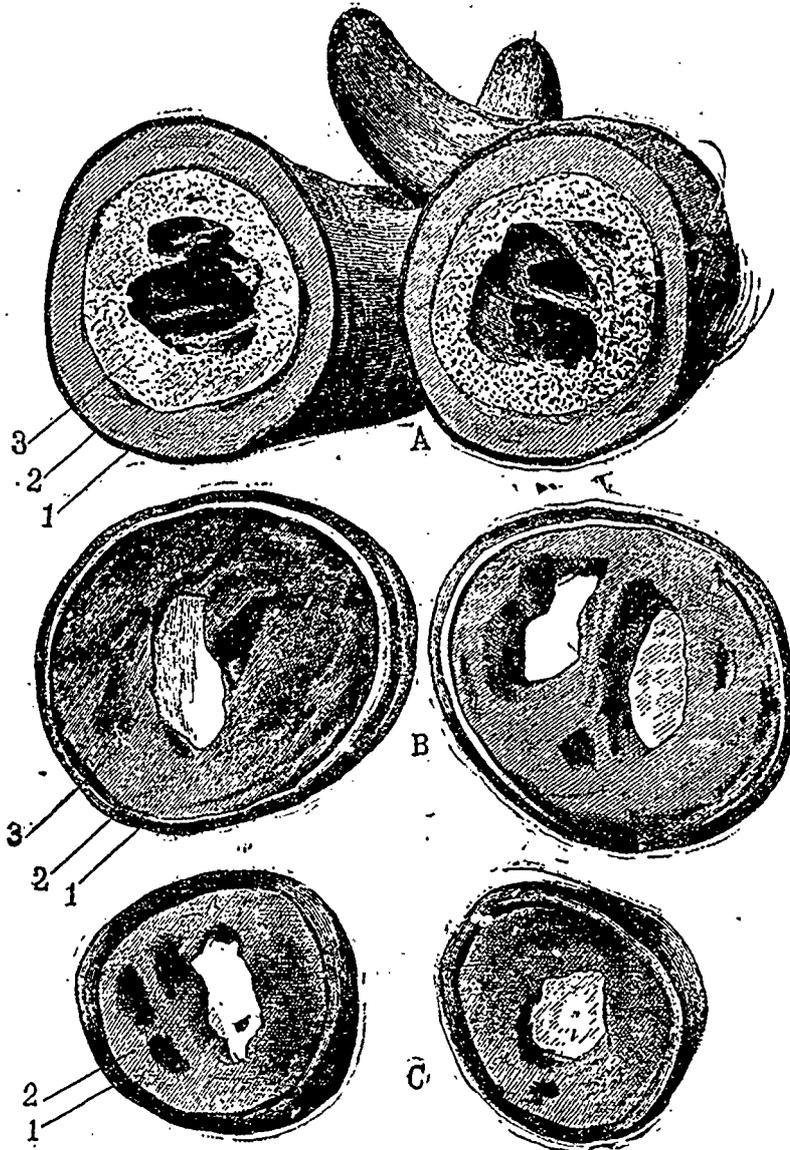
and a little chopping and earthing-up with the hand-hoe, are not what old hop-growers would call cultivation.

*Mr. Doran's farm, Lachine Rapids.*—A lovely spot, good land, and well fenced; the crops of hay and grain very promising, but the root-crop far from what I could wish to see. An acre of swedes; a good plant, but so full of weeds that the young swedes were drawn up about six inches high, and four acres of mangels much in the same condition. If crops like

deal of ox eyed daisy in the meadows, and the land near the fences showed a lot of couch grass.

Twenty three cows are kept, and the milk sent into Montreal. A good lot of dairymen's grade shorthorns, showing plenty of milking points, and a tendency to be soon fit for the butcher when dried off. In fact, a very superior style of cow.

*Pastures.*—The pastures the stock had fed off were well



these are frequent in the province, I do not wonder at farmers dreading their cultivation. Talk of \$3 40 an acre for singling and horse-hoeing! Why, no man could single those I am speaking of for less than three times that sum. Well, if people will put unrotted, or rather *unheated*, raw dung on the land, weeds will come. The singling should have been done ten days before my visit was paid, but, owing to the erection of a wind-mill, the hands were too busy to attend to it. A good

caten down and level, though a brush of the scythe here and there would do no harm; *mais c'est de luxe* here, I know, to mow off the rough, coarse herbage. The cows were up to their briskets in grass in a fresh pasture, which looked likely to run away from them. Five more head of stock would do no harm there.

*Horses.*—Four pairs of good stout work-horses are kept, as there is a good deal of road-work to do, add there are several

brood-mares, with, I was told, ten foals at foot! Mr. Henderson, of Petite Côte, supplied the stallion.

**Implements.**—The land was evidently well worked, and the ploughs and harrows were of the right sort. A heavyish roller, with the box-frame well filled with large stones, adding, I should say, some 5 cwt. to the weight of the cylinder. A piece of potatoes, lately planted, had the finest skin on it I have seen for a long time. I, on seeing it, asked the lad who showed me round—a very intelligent fellow from Hampshire (1)—where the chain harrows were, and he soon found them lying under the fence. The use of this implement should be universal. The old saddle back harrows, that keep the drill raised up to its original height, was all very well in the undrained condition of the farms in the north of England and in Scotland forty or fifty years ago, but in this dry climate, the sooner after sowing or planting the drills are levelled and the middle worked up, by the action, first of the chain-harrow, to be followed by the horse hoe, the moment the rows are perceptible, the better.

**Apples.**—Mr. Doran's apple orchard seems to be very prolific. Last year, 2,000 barrels were sold and carted into Montreal. Price, one dollar a bushel, the purchaser, I presume, gathering, packing, and finding the barrels; Mr. Doran carting to town at 12½ cts a barrel. Price seems low—all dessert fruit—compared with what the retailers charge.

**Grain crops**—A tremendous flush of straw all about Lachine, owing to the dripping weather in June. All the root-crop land grubbed up—June 20th—at Dawes' farm, and fodder-corn sown by drill, in rows 7 inches apart. There will be an immense lot of silage for the winter. (2) Land ploughed last November, and never touched since, being sown with fodder-corn—sowing machine could hardly work for the weeds, which will probably beat the corn. Potatoes look splendid, cultivation perfect, both with hand hoe and horse-hoe. About ½ an acre of swedes on the Cross farm shows a fair plant—all the rest of the three-acre piece vanished.

**Hay.**—On Thursday, June 28th, the hay-harvest began on the Dawes' farm. Tares sown May 14th, in blossom July 4th, just seven weeks and three days.

#### The Rot in Potatoes and Tomatoes.

Many investigations have been made to find a remedy for the disease which has affected the potato for so many years, and which, in certain seasons, and in certain districts, has completely destroyed that invaluable tuber.

In proportion as the cultivation of the tomato has become general, so the potato-disease has attacked that allied plant, both being of the family of the solanaceae. In some places, the tomato rots as much as the potato, though it has been observed that the disease does not attack the tomato until it has done its best to destroy the other, which is a sign that the disease attacks the potato more frequently than the tomato.

An almost infallible remedy against the rot is supposed to have been discovered. Experiments, both in France and in the United States, have given excellent results. It is true that the experiments we speak of were made on vines, but, on the other hand, it has been proved that the fungus which causes the rot or mildew in the vine is perfectly similar to the one that affects the potato and the tomato, so that it is fair to expect that remedy which cures the disease in the one will cure it in the others. The following are the processes for prepar-

ing the several dressings, the application of which is recommended:

**Liquid dressing.**—Blue-water, or the Andoynaud mixture. —Dissolve a pound of sulphate of copper in 3 or 4 gallons of hot water; when the mixture is cool, add three half-pints of the liquid ammonia of commerce, and pour it into a wooden vessel in which have been placed 22 gallons more water. Apply this liquid in a still time with a *spraying nozzle*, in quantity enough to sprinkle the plant thoroughly without drowning it. Apply it first when the plants are coming into flower, the second time eight or ten days afterwards, and, if the weather seems to favour the development of the disease, add a third and even a fourth sprinkling, at about the same intervals.

**Copper mixture of the Gironde.**—Dissolve 4 lbs. of sulphate of copper in 16 gallons of water, and in another vessel slake 4 lbs. of lime in a gallon of water. When the latter mixture is cool, mix it slowly and carefully with the other, stirring continually. This should be prepared some days before being used. The sulphate of copper should be ground, as it mixes much better in the powdered than in the crystalline state.

This dressing, which, owing to the lime, will be rather thick, should be applied with a small broom made of twigs. Plunge the broom into the mixture and shake it over the plants so as to wet them thoroughly. This is a troublesome and not very cheap method, and any one who has a good deal of land to go over would do well to buy a pump with a spraying nozzle. The essential qualities of a good pump of this kind are ease and rapidity of working, together with economy in the use of the application. The rules for using this form of remedy, are the same as those for using the former one.

**Powder dressing. Sulphatine;** mix 2 lbs. of anhydrous sulphate of copper with 20 lbs. of flowers of brimstone and 10 lbs. of air-slaked lime.

**Another way. Blight powder.**—Mix 3 lbs. of sulphate of copper with 97 lbs. of flowers of brimstone. This is sufficient for five acres of potatoes.

In powder, these remedies are more convenient to carry and apply than in a liquid form, and consequently should be thus used, if they are shown to be equally efficacious.

The best way of applying these powders, which should always be used in calm weather, when the leaves of the plants are covered with dew, or after a shower, is to put them into a gigantic sort of pepper-caster, with a metallic bottom pierced with holes, and to shake this over the plants. Too much of these powders, especially of the sulphatine, would burn the plant; just enough of them should be given to be visible on the leaves. The powders should be applied to the under as well as to the upper side of the leaves, and the best implement for this purpose is a blower or bellows with an extension tube.

To obtain the best results from these different mixtures, they must be well prepared, applied at a favourable time and with judgment, the atmospheric conditions must be suitable, the dressings sufficiently frequent, and the ingredients used of the best quality.

The other means of fighting the rot described in the circular whence we have drawn these hints, are change of seed, and the invention of new kinds, the selection of varieties which are less subject to attacks of this disease, and the choosing of light, well-drained soil for their cultivation.

(From the French.)

J. C. CHAPUIS.

#### OUR ENGRAVINGS.

**Scotch Prize Clyde Stallion, Prince Lawrence.**—This is a portrait of the first prize winner at the last Highland and

(1) Not perceptible from his tongue! I believe that in 10 years, even the West-Riding people will speak good English! A. R. J. F.

(2) But watery stuff, of course. It is five times to thick.

A. R. J. F.

Agricultural Society's show. He was bred by Mr. W. Gardner, Cashley, Buckley, Stirlingshire, his sire being by Prince of Wales, 673, and his dam, Cashley Bet, 3506, by Prince David, 643.

*Typical White Dorkings.*

*Sections of horns.—See p. 119.*

We re-engage in reduced size from the London Live-Stock Journal the portrait of a distinguished Clyde stallion, first-prize winner at the last Highland and Agricultural Society's show. Prince Lawrence is a bay, foaled May, 1883, bred by Mr. W. Gardner, Cashley, Buckley, Stirlingshire, his sire being Prince George of Wales, by Prince of Wales 673, and his dam Cashley. Bet 3506, by Prince David 643. His present owner is Peter Crawford, Carruchan, Dumfries.

## THE VETERINARIAN.

### DISHORNING-METHODS AND RESULTS.

The first bulletin of the Agricultural Experiment Station of the University of Tennessee is largely devoted to an elaborate paper on dishorning, by the assistant director, Mr. CHARLES S. PLUMB. The general conclusions arrived at are as follows:

1. The most desirable method of fastening an animal for dishorning (1), so as to keep it satisfactorily quiet, is to cast it, bind the feet firmly together, and hold the head in a halter close to the ground, either by the hands, or by placing a plank across the neck; to then remove the horn uppermost, and by means of a rope of sufficient length, fastened where the feet come together, to turn the animal upon the other side, and remove the remaining horn.

2. For removing the horns, an ordinary meat saw, with a set screw in the end of the blade furthest from the handle that will enable the blade to be tightened, but not to turn from side to side, is perfectly satisfactory. A strong running-rope halter, and about 20 feet of three-eighths inch rope are also necessary.

3. The horns should be removed as close to the head as possible, without cutting the skull proper. It is best to cut down from one-fourth to one-half inch of flesh, at the base of the horn. The sawing should be done rapidly, and with long sweeps of the arm if possible.

4. Animals one and two years of age appear to suffer considerably in dishorning. The painful effects decrease by age, so that an animal ten years old may suffer but very little. This is owing to the layer of flesh surrounding the base of the horn, which is much thicker in young than old animals.

Dishorning causes an abnormal increase of pulsation and temperature, which extends over several days. The appetite is also affected during the twenty four hours succeeding.

5. Dishorning is more especially to be recommended for those animals that are what are termed "masters," to be applied to bulls, and to beef animals that are to be kept quiet and closely stabled or shipped.

6. From evidence quoted from other sources, it appears that dishorning is not necessarily a cruel practice, but may be conducted to promote ends that are both humane and desirable in live stock breeding.

The opinions expressed in paragraph No. 4 are derived from the observations which follow:

A represents the horns from a steer of 22 months. These horns were cut off, taken to a professional artist the same day, and drawn at once. In A, fig. 1, is a thin, hard, oily-appearing covering that entirely surrounds the bone; fig. 2 is a thick, fleshy substance, that extends a slight distance up the horn,

this being the material that makes so many horns thick at the base, this layer is quite yielding to the touch. Fig. 3 represents the true bony tissue of the horn, with the cavity in the centre; this tissue is very porous.

B represents a cross-section of the horns of an animal four years of age. The outer layer is 1; the next, or fleshy, is 2, and 3 the inner bony tissue. B and C were drawn after the horns had been cut some days, so that the fleshy matter had shrunken some. However, in an animal four years of age, in our experience, the layer of flesh about the base of the horn is not so thick as that in a younger animal. Further, the animal that appeared to suffer most from dishorning, was the steer 22 months old, whose horns are figured at A.

The horns shown at C are from a cow 10 years old, and present but two striking layers, viz. 1, the outer, hard, bony shell of the horn proper, and 2, the bony structure within. There was almost no flesh about the base of the horn. This animal appeared to suffer from dishorning almost none at all. So far as our experience will enable us to judge, the three sets of horns, A, B and C, represent distinct conditions of development, and the operation of dishorning becomes less and less painful, the more we approach C from A. While there is liability of the wounds about the stump of the horn in A becoming sore, and maturing (suppurating?) for some little time, as occurred in the case of a steer the same age as that of A, they rapidly heal where the amount of flesh is very slight, as occurred with C.

In no case was any substance placed over the part of the horns left on the head. As soon as the horns were removed, the animals were returned to their stalls. The cavities in the stumps if left to themselves gradually fill up, first with blood and serum, and later with bony tissue, and the hairs about the horns gradually cover the stumps.

The veterinary surgeon in attendance during the dishorning of the four animals under experiment, was requested to give his professional opinion, in writing, concerning the general physical effect upon the animals, from thus sawing off the horns. His letter was:

KNOXVILLE, TENN.

As I am called upon to give my opinion as to dishorning cattle, I will say that the operation of amputating the horns is very painful, and not infrequently followed by evil results. It is surely a cruel practice, excepting for disease, fracture, faulty direction, deformity, and to diminish damages from vicious cattle.

A. D. GALBRAITH, D. V. S.

*Why Dishorn?*—The last sentence in the statement of Dr. Galbraith explains why dishorning is practiced. Where several animal animals are turned together, a "master" usually is found that uses its horns remorselessly upon the others. In such cases more or less harm comes from fighting in the way of breaking horns, hooking, etc. Further, a strong master cow will easily keep from the hay-rack or water-trough a dozen others, until she is ready to go. Such a herd of cattle is constantly quarreling, always on the move, never peacefully quiet, excepting at wide range. By removing the horns from the most powerful and vicious of these animals, the entire herd can be made more peaceful. Twenty polled animals will occupy the claim is made, less room either in stalls or in shipping than the same number having large horns. The reason for the removal of horns from the bull is very evident—simply to make the animal more defenceless, and give the herdsman better protection. A considerable number of human lives are lost each year on account of vicious bulls. Certainly we must admit that it is much pleasanter to feed in the manger a polled animal than one with long horns.

Country Gentleman.

(1) Mr. Plumb falls into the error of calling it "de horning"—which we correct in copying.

Ste-Thérèse de Blainville, P. Q.

Dear Sir,—Having noticed from time to time some very useful hints on different subjects, I have taken the liberty to write and ask your advice concerning the udder of a newly calved heifer. Three of her teats are an ordinary size, the fourth one is very large and very hard to milk, the other three are easy enough to milk; will you kindly advise me what to do for it in your next issue of the Journal.

Yours, &c., W. STUART.

Answer.—Mr. Stuart, whose letter arrived too late to be answered in our July number, would find it useful to insert, very carefully, one of the milking tubes, an engraving of which is given at p. 125, into the faulty teat, and keep it there for three or four hours at a time for several days. Gradual expansion of the duct will follow, and the obstruction disappear.

A. R. J. F.

Wheat in Central Illinois promises much better now than it did a month ago, and the prospect for a good yield of oats could hardly be better than at present. Pastures are doing fairly well where not over stocked. This is an off year for clover. The hay crop will be less than what it usually averages.

Mr. Geo. Aitken, manager of the Billings Farm, Woodstock, Vt., writes that farmers are waking up to the fact that they must improve the mutton quality of their flocks, and that the Southdown is the best

for that purpose. A letter to day from Texas asks where a car, load of Southdown rams can be bought. Such letters from Texas are not uncommon.

Mr. J. W. Ramsey who went from here last month to buy Percheron horses in France, writes from Eure et Loir that he has finished buying and is about ready to ship for New-York or Montreal. His purchases this time are all two year old colts. Though young he thinks they will not be found wanting in size, bone, color or quality.

Mr B. F. Pickrell, Jansville, Ill., is a firm believer in the Clydesdale horse, whatever others may think of the English Shire, the Percheron or other draft breeds. He has now over a dozen pure-bred Clydes, with imported Mr. Byrne 3394 at their head, as good a draft horse as any one could wish to own or use.

Cattle, sheep and hogs sold low at the Harrestown, Ill., sales on the 13th and 14th inst.

The few C. C. Jerseys sold by Mr. O. P. Chapman, at Pittsfield, Ill., on the 14th inst. averaged \$103 33.

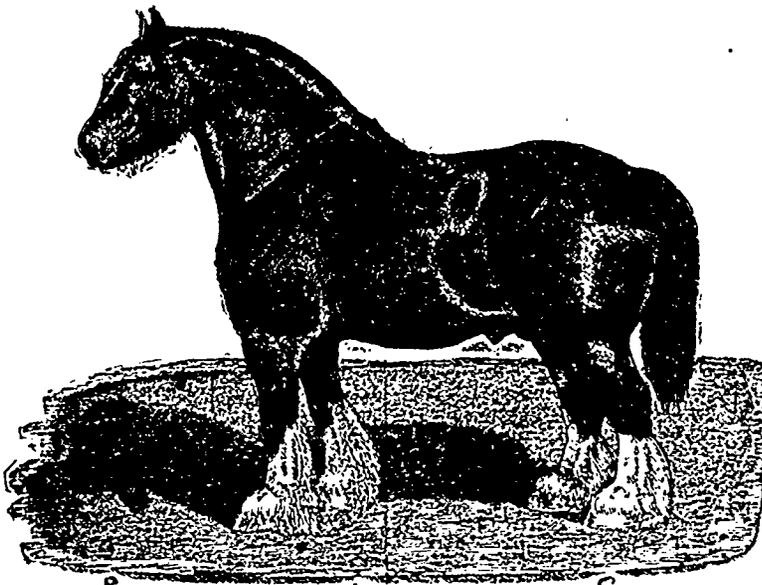
Very little is heard here any more of hog cholera. This is owing in part to the fact that fewer hogs are kept, and better care given then that formerly.

We lost a good Jersey cow at "How Hill" this week from milk fever. Think she might have been saved had 1½ lb. of Epsom salts been given her in time before calving. It is recommended by some that this be given immediately after calving. If this much dreaded malady would take off the poorest cows in the herd instead of, as it almost invariably does, the best, we could afford to be somewhat neglectful of it, but with the rule as it is we cannot be too careful as to feed and treatment of the best cows about the time of calving. Springfield, Ill. PHIL. THURFON.

Corn Fodder and Clover.

EDS. COUNTRY GENTLEMAN—Great interest is manifested in the corn-fodder and ensilage question at the present time. The amount that can be raised to the acre, and its great value for winter feeding of dairy stock, alike commend it to general attention. The institutes held in various localities

make this the leading topic for discussion, and the columns of the agricultural papers are filled with facts and figures relative to the subject. In this state of things there is danger that our old, long-tried, well-proved and equally valuable friend, the clove. plant, will be neglected. Among those with whom I have conversed in relation to farm management, very few have grown sufficient clover to secure a great amount of profit, and a still less number have any correct idea of the comparative value of the crop.



SCOTCH PRIZE CLYDE STALLION, PRINCE LAWRENCE.

The net value of an acre of clover is as much as that of an acre of corn-fodder, and as a rule, where much corn fodder is grown, a large amount of clover should be raised. Let us compare the cost and value of the two products. The average acre of corn fodder will not be of greater feeding value than five tons of timothy hay. With hay at \$10 per ton, an acre of such fodder will be worth \$50. It will cost about as follows:

Plowing, harrowing and drilling seed...	\$4.00
Seed .....	1.00
Cultivation of growing crop.....	1.00
If cut with reaper, cocked and stacked, which is least expensive.....	4.00
Manure .....	10.00
<hr/>	
Total cost.....	\$20.00
<hr/>	
Net value.. .....	\$30.00

If cut by hand, drawn to the barn green, and cut into the silo, it will cost several dollars more to the acre. It will pro-

bably need more than \$10 worth of manure to insure a full crop one year with another.

The clover crop will cost :

Seed .....	\$1.50
Cutting twice, raking, drawing, &c....	5 00
<b>Total .....</b>	<b>\$6:50</b>
Cr.	
First cutting, 2½ tons.....	\$25 00
Second cutting, 1 ton.....	10.00
<b>Total .....</b>	<b>\$35.00</b>
<b>Net value per acre.....</b>	<b>\$28.50</b>

On corn land in this section the clover crop may safely be estimated as above for two years after seeding, and the soil will be in better condition to produce a crop of corn or potatoes when plowed at the end of that time than at its commencement. The increase in fertility will more than balance the difference in net value. Some of our farmers can investigate this subject, and put it to the test of personal experience with great profit to themselves. The feeding value of clover is nearly double that of corn fodder when fed green, and the relative value is the same when dried.

A bit of farm and family history with which I am acquainted may prove interesting to your readers, as bearing on the value of clover and also on the small-farm question recently discussed in this paper. A little more than fifty years ago, a mechanic, the owner of a small farm in Jefferson county, N. Y., sold out and removed to Onondaga county. The little capital that he possessed was expended in part payment for a 90-acre farm, with cheap buildings and poor fences, and in need of underdraining in many places. His family consisted of an aged mother, an invalid wife, and seven children all under sixteen years of age. None of the family ever worked out for wages, unless perhaps for a short time to accommodate a neighbor. The family was supported, the debt paid, the farm well fenced and underdrained where needed, a fine house and barn erected, and the entire place brought into a high state of fertility. His sons were assisted in purchasing neighboring farms, and several of his daughters established

in homes of their own. Later in life, the old farmer had money at interest. All this was realized from labor expended on less than one hundred acres of land. If the old gentleman had been interrogated as to his success, he would have answered, "It is all owing to careful attention to business, and clover." The farm products sold were wheat, barley, clover seed and some butter and beef. Grain and clover seed were the main crops, but 15 or 20 head of live stock, including horses, were on the place when I visited him 25 years ago. He told me that he had no land but what was rich enough for an onion bed, and the appearance of the fields as we walked over them confirmed his assertion. Some of the fields most remote from the barn had never received a load of manure, but had been brought to an excellent state of fertility under his four year rotation, or, what he termed, "two years

up and two years down." The system was about as follows : First year, clover sod plowed and cropped with corn, potatoes and oats ; second year, wheat and barley, and seeded with a peck of clover and a peck of timothy seed to the acre ; third and fourth years, clover. One field of clover was pastured until some time in June, and afterward cut for the seed the same year. The other field was cut for hay and then pastured in the fall. Nearly all the pasturing of the farm was done on the clover fields.

Under this system, his farm grew more productive year by year. How long it would have done so I do not

know. The old gentleman and more than half his family are dead, and the farm has passed into other hands. It was on visiting that farm that I first realized the value of clover, and what I then learned is still a source of profit. With a correct understanding of the value of corn-fodder and clover, and a knowledge and practice of the best methods of growing, curing and feeding the same, success is insured on a limited number of acres, if the soil is suitable for the production of these crops. (1)

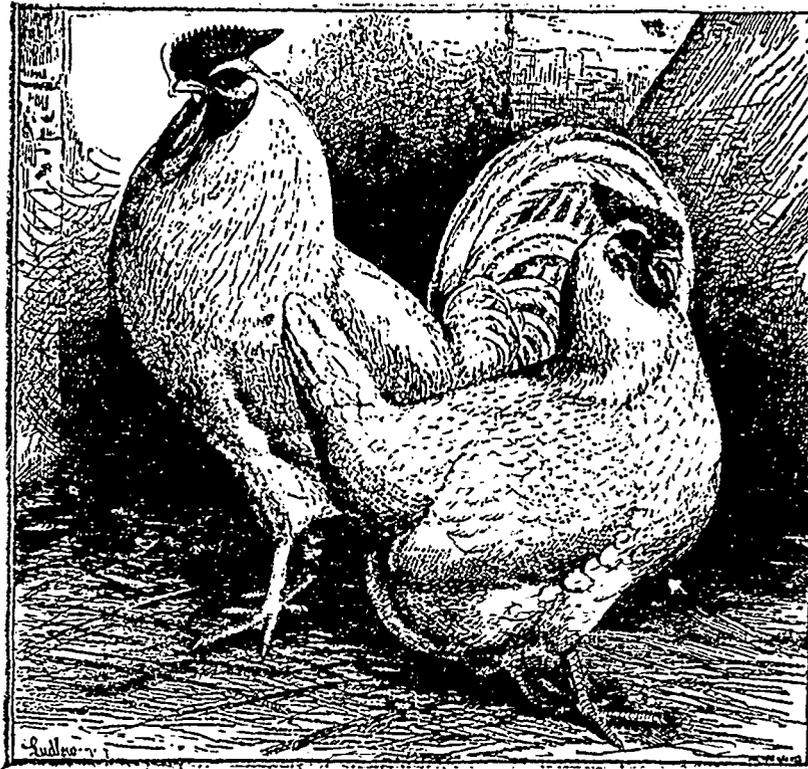
Lewis County, N. Y.

C. S. RICE.

**How to Spoil a Cow.**

The greatest drawback in dairy work is the difficulty in obtaining honest, faithful servants. So far as pecuniary mat-

(1) Good for a few rotations, but the land will in the long run become clover-sick.  
A. R. J. F.



TYPICAL ENGLISH WHITE DORKINGS.

ters are concerned there is generally no complaint to make; but there is another kind of honesty, which is very scarce. The majority of milkmen are neither strict nor particular in the performance of their work when the master's eye is not upon them. The master cannot leave the milking-shed in their sole charge, and he cannot trust the servants to treat the cows with gentleness, and to milk them quickly, but without flurry, and at the same time to do the work thoroughly. Very few, if any, people can find pleasure in milking a number of cows morning and evening for month after month, but yet it must be done with the most perfect regularity and thoroughness. The udder must be emptied to the last drop, and if this is not done every time, the supply will fall short every time—that is, that nature finding that more milk has been produced than is required, will abstain from producing so much milk and devote the food to the production of fat or of muscle. Almost anybody can milk a cow, but there are few who can do it properly. It is an art, and the man who can practice it is worth more to the dairyman than any other help. The art of milking is to draw it off steadily, quickly (by no means hurriedly), and completely. Scarcely any two cows are exactly alike in disposition and in the character or nature of their teats and udder. Some are hard to milk, and have very small apertures; some have tender teats; some are quite easy to milk; some cows are phlegmatic, others are lively and nervous. Now it is extremely difficult to find a servant who will trouble himself to study the individualities of the various cows, and try to humor their caprices or adopt his plans to their peculiarities. He wants to get through his "job" as quickly and easily as possible. The easy-milk cow is his favorite, and comes off by far the best, but he sits down beside the hard milker with a kind of grudge against her supposed failing. He expects some trouble with the timid one, and this very fact is likely to make the trouble appear. The animals know him and his temper and moods far better than he knows theirs. They must be humored and put into a good humour. They may be forced into submission, but they ought instead to be coaxed or persuaded into willing compliance. If they are roughly handled, approached hastily, and without any care for their "mood," it irritates and worries them, the fretting, the agitation, and the worry make them fall in quantity, and within very short time the decrease in yield is quite marked. The worst of it is that a return to proper treatment will not restore the former condition of things when the supply has fallen off through wrong treatment, through the employment of a careless servant; it cannot be restored by entrusting the cows to the care of even the most careful person. Under proper feeding and kindly treatment the udder of the cow becomes distended with milk at regular intervals, and when the time comes she looks forward to be relieved of her burthen. If the milkman understands the cow she looks to him as her friend, and yields up her milk with pleasure, because the distention of the udder is painful to a certain extent. But when a cow becomes troublesome, tries to kick over the pail, won't give down her milk, and so on, there is a cause for it, and the cause will generally be found outside the cow—she has not been properly treated, and she resents it. If her delivery is slow, perhaps the milkman has been too hurried, and hurts the teats in trying to force the flow; if timid, he may have been too hasty or abrupt. At any rate, it is always safe to look first for the fault in the man, and not in the cow. Cows do not like to be kept too long waiting to be milked, and they are even capable of jealousy if one cow is milked out of her turn to the neglect of another. Regularity in feeding, in milking, and perfect gentleness and kindness in dealing with the cows are essential to success. Any breach of these desiderata is inevitably marked by a falling off in the yield and a

consequent diminution of profits. In a large dairy, where perhaps 50 or 150 cows are milked, it would pay well to give a good salary to a foreman of the milkers, whose sole duty it should be to see that the cows are properly treated and carefully milked. He should test each cow, and also keep a perfect record of the yield of each at every milking. The scales alone would tell him whether the milkmen were doing their duty faithfully.—*Australian Weekly Times.*

#### Does it Pay to Feed Grain to Cows in Summer?

The above topic was treated in the late meeting of the Michigan Dairyman's Association by Mr. N. J. Strong, as follows, as reported in the *Michigan Dairyman*:

"Yes, in four ways. 1. If cows are fed a liberal ration of palatable, nutritious ground feed, morning and night, they require no driving, but are ready to walk into stalls as soon as the door is open. No boy or dog is necessary to chase the fields over to persuade them, but about milking time they are ready to walk quietly from pasture to barn, and the result is that pails are fuller, as there has been no excitement. Keep cows quiet, and they give better results. Thus a saving of labor and patience—pay, in part, for the grain fed. 2. Grain fed cows return a quality of milk superior to those not so treated. Cheese makers will tell you that a larger yield of cheese and of better quality can be made from grain fed cows. It is true that we have records of a few extra herds that have shown fair returns without grain, but treat the same cows with a few pounds of bran, morning and night, and note the results. I am of the opinion that what are called ordinary cows show more improvement, proportionally, by being fed grain than do the heavier milkers, as poor soil is more sensitive to the application of fertilizers than richer soils, but a very poor milker can never make a good one under any treatment. 3. The yield. This is a matter that interests the dairyman more, perhaps, than others. Give us large yields and we are satisfied; but don't milk the pump, as some have done—cheese is made from milk, and so is butter. I have only to refer you to such men as B. E. Peebles, W. Worden, Nathan Shumway and others to substantiate the fact that it pays to feed grain in summer. Visit Fairfield, the home of the pioneer cheese-makers of the county and State—Rufus Baker and President Horton. The first named gentleman opened the first factory twenty-two years ago this coming spring and was followed by Samuel Horton, father of our worthy president, by only four days, men of large experience in the management of cows and their products. Ask them if it pays to feed grain in summer, and I think they will tell you that if grain is worth one cent per pound your returns will be greater by, at least, a per cent proportioned to the price of products. I have practiced feeding my cows, for the past five years or more, a mess of grain twice each day during milking season, and am satisfied that my cows pay better than before, although I have made no figures. Grain, ground, absorbs the juices of grass and the two are assimilated, and the distended stomach of the cow becomes less so, notwithstanding the fact that more food is there than before. As to kinds of grain, say from May to August, I think bran the best. In March and April, would feed corn and oats or bran and middlings, two of bran and one of middlings. Beginning in August, the usual feed in southern Lenawee is corn fodder with the corn on. This makes a very good feed when pastures begin to dry up and will sustain flow of milk fairly well, especially if a little bran be added. I have advocated the use of bran because I believe that, pound for pound, it is worth more for feeding milch cows than most other grains. The same number of pounds will return more than meal, and when it is put in at from \$13 to \$15 per ton it is

a very economical food. I am not alone—Professor Jenkins, of Connecticut, assisted by three or four other eminent chemists, rates it at \$2.66 per ton above cornmeal and \$2.61 above oatmeal or ground oats. I regard good feed, comfortable surroundings and the best of care indispensable in making a cow profitable. Some of us can remember when cows had to lean against straw stacks in winter, with no other shelter, with only a little hay on the ground for bedding, and in summer they had to run with sheep or colts. But those times are passed, and a majority of dairymen now-a-days put their cows in the stable 365 days in a year—and this year one more. Yet, I am sorry to say, a few follow in the footsteps of their illustrious predecessors. 4. And lastly. It pays to feed cows grain in summer because of their better condition as the result of the feeding.—*Dairy World*.

### MILKING A COW.

M. J. N. Muncey of Iowa contributes to the *Farmer's Review* the following sensible article :

Almost every young man who offers his services to farmers will say in reply to the question, "Can you milk?" "Yes, I have done the milking at home; I think I can suit you." Very few, however, are experts at that work. Very few know how to milk the easiest, quickest and manage the different cows to the best advantage. It is not to be wondered at. The farmers themselves have not usually given their sons any instructions in milking. They seem to think that if the boy can get the milk into the pail that is all that is necessary. Did you ever think that there is as much science in milking a cow as there is in sticking a hog? Not every man can properly stick a hog in a pork-packing establishment. Practice and study of the employes have made them experts. It is just so in milking. Let me give actual illustrations: One man places the stool at the side of the cow, just where he wants it, being careful that the stool should occupy a firm "posish." He then seats himself carefully, takes hold of a teat and the cow steps around about a foot out of his way, and he must either move the stool or reach too far. He moves. The difference between this performance and that of an expert is that the latter sits down in almost any good position, adjusting himself and stool to the easiest position until the cow has moved. Knowing the habits of each cow he takes hold of a teat before he is fully seated. By so doing he saves ten to fifteen minutes in milking as many cows. The difference in cows demands a difference in the mode of operation. Some cows have very sensitive teats. Others are apparently quite free from any sensation. Usually a hard milker is not sensitive in the teat. Some men squeeze the teat much harder than is necessary, being careful to get all the milk in the milk tube at each squeeze. Such milkers are usually slow and make hard work of it. Look at the question philosophically. A certain amount of muscular energy is needed to get an ounce of milk in a certain time. Is it easier and quicker to give three short squeezes or one or two long hard ones to obtain the required amount? The question may at first appear laughable but it is full of meaning. Is it easier and quicker to haul two loads of one ton each six miles on rough roads or take the two tons at one load? The answer is, of course, take a ton at a load, the team will not be worried or exhausted as much. The same is true of milking. You are exerting your muscles as much to obtain the last small amount of milk in the milk tube as you would probably to squeeze twice more and obtain three or four times the amount of milk. Some men are careless about how they sit. One man sits with his left leg stretched out in the alley. He proposes to let the cow put her foot in the pail without even an extra exertion if she wants to. Another

man sits close to the cow and in very good position except that his left knee is placed at the side and not in front of the cow's right. Some cows are so very gentle, almost any position is all right; others lift their feet so high, because of sore teats or through habit, that a man must give close attention to the cow's legs, or he will surely spill some milk, three times out of ten. I have noticed that some men are "good milkers," but fail to hold the pail far enough under the cow to catch all the milk. That's bad. True, only a few ounces lost in milking eight or ten cows, each time, but it is no small item in a year. Suppose only half an ounce per cow per milking is milked on the floor. That amounts to 230 pounds of milk per year, worth about \$2 in Iowa. And then, too, if it is the last milk in the udder that is carelessly squirted at the side of the pail and on the floor, the loss is two or three times as great, because the last milk that flows contains two to four times as much cream as the first. Good judgment is needed to tell when to quit milking. A cow giving fifty pounds of milk in twenty-four hours, secretes more than two pounds per hour, or one half ounce per minute. A slow man might milk all day. A slow milker teaches a cow bad habits. She soon gives her milk down too fast. Change the milker and the expert is at a disadvantage. She fails to let the milk down as fast as he can milk. Every man who gets cash for his work and fails to milk his cows clean, ought to wear around his neck or on his watch-chain a leather badge on which is printed, "Discharged because I stole." After thirty year's experience, my neighbor says: "I would rather a man would steal from my pocket-book than neglect to milk a cow clean." A man ought to milk on an average eight cows, giving 120 pounds per milking, in one hour. Comparatively few men can do it.

### Estimate of Carcase Weight.

In your paper of December 22nd, 1884, you very kindly (on page 776) reviewed, in very favourable terms, a paper I had read before the Marshbrook Farmers' Club, in which I gave a table for estimating value of cattle and sheep by live weight, amongst other things, advocating selling "store and fat animals by live weight." Sir John Lawes also wrote me:—"One of the most practical and sensible papers ever read before a farmers' club," and I had considerable correspondence with him on the cattle-weighing question. Since then I have still gone on pressing the subject on farmers at every opportunity, and I gave Mr. Westley Richards considerable information when the Weighing of Cattle Bill was before Parliament, as he was urging members to support it. I had arranged tables for my own use, and found the simple one which I now enclose you a very useful one, and I determined to publish it, and wrote to Sir J. B. Lawes, when I found he was also about publishing some. I think his tables, with some slight additions which I have suggested to him, will be most complete, and very useful; but you know the difficulty there is in getting farmers to look at any tables of any kind. They do all the reckoning in their heads. Now, the machines as put up weigh by the hundred weight, and I found in practice that I could easily, in my head, reckon the value of an animal from this at once if I had the price per cwt., so I have adopted this, and use nothing myself, or my bailiff, but the pocket-table at the machine. If we could get the price of live weight quoted per stone of 14 lb. or per cwt., it would be a fact which people could rely upon. The present quotations of per lb. or per stone of 8 lb. dead weight are not facts. If a farmer saw that beasts made so much per stone or per cwt. alive he could weigh his own, and know their value; as it is he has to guess at it. I do not look upon it as a thing impossible that we may in time come to sell by

live weight, and although I should be glad to see the cental accepted as a uniform weight, so long as our machines weigh by the cwt. we must sell by it or by the stone of 14 lb. which works with it; but the cwt. is better because we avoid halfpence I send you a pocket table, as advertised in your paper; it is on untearable cloth card. I also inclose you specimens of other tables I arranged, but which I do not find I require often. Table 2 enables you to tell the total value of an animal, having weight and price per cwt. Table 3 gives price per cwt. equal to price per stone of 14 lb. This is for those who are in the habit of estimating live weight by 14 lb. stone. Table 4 is for those who are in the habit of guessing the dead weight, to enable a person selling by live weight to tell them what he considers the carcase of dead weight is in lbs., stones of 14 lb. or 8 lb., or cwt., according to the weight they are used to. I have no wish to enter into competition with Sir J. Lawes; my table is quite different. I have no wish to make money by my tables, and shall not push them, as my time is very fully engaged in my land agency and arbitration business.—*T. H. Thursfield.*

We have now got on the subject of rations, and unless we adopt a standard we are again told that we shall be ruined; and a case is given where a gain of £500 a year was effected by its adoption. I can only say there must have been very bad management before. But are we to believe that animals only assimilate a certain proportion of each kind of food? Are we to give to the racehorse in training the proportions of fat-forming food as we would the Clydesdale we are making up for show or for sale? Are we to believe that we cannot make a beast or sheep put on more fat, or more lean, as we may wish? Are we to believe that we cannot alter the "handle" of a beast or a sheep by increasing or diminishing the amount of flesh forming food. If so, well; but I think if Mr. F. J. Lloyd were to ask Mr. Stratton, or Mr. Stephenson, of Benton, or Mr. Handley, or Mr. Teasdale Hutchison [and they are adepts], they would tell him otherwise.

Again, how it is that for a month before killing a pig in the South of England it is usual to give it [the pig] peas, and in the North of England oatmeal, to make the carcase more firm, and have a greater proportion of lean meat [this is only done when the pig is for home consumption]? How did the pig get on without these fleshformers?

And if this standard is infallible, how is it that thousands—aye, tens of thousand—of sheep are fattened every winter between Morecambe Bay and the Solway on turnips alone, the turnips often making £10 per acre? Where is the waste there?

And how is it that you have the finest peasantry in the world in Tipperary, and their diet for six months of the year is potatoes alone? I was told by the late Mr. Benson, of Kilshane, that during the potato famine, when their diet was oatmeal, they were not nearly so strong as before? How does this conform to the standard ration?

The unwritten science of cattle-feeding and of rations is of much greater importance than anything chemistry can suggest, and at this the farmer is an "adept." Now, take your standard ration, 24 lbs of dry matter in food to each 1,000 lbs. live weight of the animal. This dry matter, to put it in plain English, is to consist of "12½ lbs. of heat-formers." It is well known that ruminants require a large amount of bulky food, which in winter will consist of hay or straw. The quality of these differs, as we well know; the hay grown on some land being of twice the feeding value of other hay grown even on the same farm. The value of straw, too, for feeding purposes, varies very much in different districts, and also is dependent on the state of ripeness when cut. Is the farmer, then, to have these bulky foods analysed, that he may know how

much and what kind of concentrated food is required? No! Experience has already taught him that. He is an "adept." The value also of roots is dependent not only upon the soil and climate, but also on the class of manure with which they are grown: those grown with phosphatic manures being much more nutritious than those grown with nitrogenous manures. This is well known by the Northcountry heep feeders. And I maintain that if the quality of a turnip can be altered by the manure with which it is grown, much more can the quality of beef or mutton by the nature of the food on which the animal is fed, and that animals are amenable to the skill of the feeder. That skill can only be obtained by experience. "The master's eye" still "feedeth the ox."

Farmers would only be too glad of any science which would "benefit their pockets," but that science must be presented to them in a different form to which it is usually presented in the present day, as that must be taken largely *cum grano salis*. The farmer is suffering from too much scientific advice and too little lime. (1) If half the money which has been spent on artificial manures had been spent on lime during the last twenty years, the farmer, the land, and the country would have been all the richer to-day.—*A WESTMORELAND FARMER.*

**BATH AND WEST OF ENGLAND SOCIETY.**—The show at Newport closed on Monday. Unfavorable weather had militated against the attendance, the total of the five days numbering a few short of 53,500. The working dairy was the centre of attraction again on the closing day. In the afternoon there took place the challenge competition for gold and silver medals by the winners of prizes in the various preceding butter-making competitions. For these there were eleven entries. The points considered by the judges were weight and quality, but weight was not taken into account so much as quality. The work done was better than on any of the other days, and excellence of the samples was so even that it was only after the most severe test that the gold prize was awarded to Miss Hassell, Eaglesbatch. The silver medal went to Miss Keel, Stanton Drew, Bristol; and the certificate of merit to Miss Davey, Cannington, Bridgewater. Two ladies were very highly commended, viz. Mrs. Williams, Winford, Somerset, and Mrs. Lear, Broad Clyst, Exeter. All the other competitors were highly commended. The result of the test of methods for separating cream was also made known on Monday. On the previous Wednesday each of the competitors was served with fourteen gallons of milk. In one case—that of the Victoria Cream Separator, which was worked by steam-power—the cream was separated at once, but in all the others it stood till eight o'clock next evening, and was then removed. From that time until the following Monday it was kept under lock and key in water surrounded by ice, and when taken out was churned for the bestowal of certificates of merit. The test produced the following result, with the weights:—

	Weight of butter.
1. The Victoria Cream Separator.....	41. 13ozs.
2. Jersey Creamer.....	4lb. 12ozs.
3. Rymer Pan.....	4lb. 12ozs.
4. Shallow Pan.....	4lb. 9ozs.
5. Devonshire.....	3lb. 15ozs.
6. Canadian Creamer.....	3lb. 14ozs.
7. Schwartz System.....	3lb. 10ozs.

(1) Right in *weeping* districts, like Westmoreland and Cornwall (Eng.), but in Kent, lime is almost useless. It never pays there, except as a top dressing, in small quantities, on old meadows.

**EDS. COUNTRY GENTLEMAN**—When called on to add a cow to the dairy herd, the first thing to be observed by me is the shape, color and character of the horn; it is the index to the quality of the cow. If the horn is not right, she must possess many other points to counteract the defects, and in most cases they are not overcome. The proper shape of the horn and fine escutcheon go together; take off the horns, and you destroy one of the best modes of judging of a good cow.

The curl on the back, in the bovine race, indicates the distribution of the nourishment in the animal. It should be remote from the shoulders; then, in the cow, it will go to the formation of milk; on the steer, it will place the fat on the ribs and profitable parts, and if what forms the horns comes in contact with this fluid, it will intermix and clog the flow, and make a fleshy animal; hence no milk. (1)

I regard this practice as destructive of the milk properties of the cow, to say nothing of the cruelty and disfigurement of the animal. By no means would I use a dishorned bull.

Philadelphia, Pa.

G. B.

### COST OF HOEING ROOT-CROP.

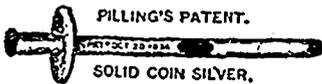
NORFOLK (WYMONDAN DISTRICT): June 14th 1888.

"The price given for hoeing roots is 7s. 6. an acre for chopping out, picking, and hoeing once afterwards. Alfred J. Learner, Crownhorpe, Wymondham." (2)

The above extract is from the English Agricultural Gazette of June 18th, 1888, and will, I hope, show that when M. Séraphin Guèvrement and I stated that the cost of singling his root-crop amounted to \$240 = about 9s. 6d., we were not amusing ourselves with the credulity of the public. Mr. Learner is a well known Norfolk farmer, and his men and women know how to use a hoe. M. l'abbé Chartier will doubtless see this statement.

JENNER FOST.

### MILKING TUBES.



### AGRICULTURAL NOTES.

BY A PRACTICAL FARMER.

BEAN AND PEA BEETLES.

Almost simultaneously with the issue of Mr. Whitehead's warning from the Agricultural Department upon the subject of bean and pea beetles, I received some specimens of beans which were infested with this nuisance, and it appears that the plague is more than usually rife all over the kingdom at the present time. The bean beetle lays its eggs within the seeds, while they are still soft in the pod; the eggs hatch out, and produce maggots, and it is during the larval form almost entirely that the damage is done; these larvæ, which, like the larvæ of other insects, seem gifted with an inordinately voracious appetite, eat away the best part of the inside of the seed, usually, however, avoiding the germ, and then, just before their impending change into the motionless pupal form, they bore a passage-way through the kernel, right up to the inside skin of the seed which is left to form a lid to the home. The winter months are passed by the insects in the larval form, but with the warm of spring they assume the state of the completed beetle, and, knocking away the lid to their passage, they emerge on bean slaughter intent. It will

be gathered from this description that seed infested with these beetles is not, to a casual observer, peculiar in appearance; the bean, until the exit of the beetle, appears to be sound and whole, and really the only indication is the tiny circular "grease spot" on the skin whose transparent appearance has been caused by the removal of the material behind it when the larva made its passage. It has been suggested that suspected seeds should be steeped in water, when the injured ones would, by reason of their diminished specific gravity tend to float. But the hole made by the larva bears so small a proportion to the bulk of the bean that the test will not answer in practice. It will be noticed, too, that the germ of the seed, containing the future plumule and radicle, remain as a rule untouched by the interloper, so that the seed has not lost the power of germination. What happens is that the seed germinates readily enough, but as it has been deprived of some of the quantity of *endosperm* or albumen necessary to its existence until such time as it has put forth its roots and leaves, the shoot scarcely has appeared above the surface of the ground when it dies from exhaustion. Naturally there is no cure for this state of things when once the maggots have begun their work, but possibly if the seed was taken in hand as soon as it was harvested, the eggs and young maggots might be destroyed without prejudice to the life of the seed. Dipping the seed in boiling water has been tried, but the consequences are almost as fatal to the seed as to the insects. Dry heating in a kiln is a more promising remedy. But I think that treatment with either chlorine or carbonic oxide gases might lead to better and more certain results than any yet attained. But this matter stands in need of experiment before it can be attempted on a large scale. The practical point is to examine beans and peas intended for seed, and if they contain beetles not to use them.

### FEEDING RATIONS.

We publish to-day another of those questions relating to the feeding of stock which have recently become frequent in our own columns and also in the columns of some of our contemporaries. If we look back but a short period no such questioning was known. Advice upon the purely practical side of feeding was frequently asked; but that there was a scientific side to the subject was, if known, certainly not considered. And yet the information now being sought by and given to the farmer is not new; it has been known for many years, and one wonders that it has not been made use of by farmers long since. In some cases it would seem that it was not needed, for there is evidence that many of our best breeders and feeders have arrived practically at that right adjustment of both quantity and quality of food which scientific feeding experiments show to be necessary. These men are, however, the most anxious of all for this scientific knowledge. They want to know *why* they have succeeded. And is it not the chief aim of science to give us "the reason why" alike of failure as of success; while therein lies its chief value to practical farmers? We must, however, guard against the reaction from "practice without principles" going to extremes and becoming "principles without practice"; if so, it will only result in failure and disappointment. The quickest way along the stream is down the middle; and in farming, also, we must avoid extremes, or we shall strike against the bank and not make any progress. *Science cannot take the place of practical experience and knowledge.* It is to the farmer what the compass is to the sailor, which, though it shows him how to steer, could not itself control the vessel. We have found out, rather late, unfortunately, that a too implicit belief in artificial manuring has led to much waste of money. Let us remember the lesson and not make the same

(1) Well!!!

(2) My "gapping out and singling by hand."

A. R. J. F.

JENNER FOST.

mistake with regard to the feeding of our live stock. After all, practical experience must be our main guide. *The analysis of a food is far from a complete statement of the properties of that food.* Just as each animal we possess has an individuality of its own, so each article of food has some special and peculiar property not revealed by chemical analysis—a physiological property, we presume. But if chemical analysis does not give us every fact connected with food, that is no reason why we should not utilise such information as it does give. There can be no doubt that the animals we feed need the three constituents—albumen, fat, and starch—to build up their bodies, and it seems evident that these should be present in a definite relation to one another if we wish to make the most of the other foods—in other words, if we are to feed profitably. Let, then, one and all of us discover how far our practice meets this demand, and, if not, how we can improve it, for we may be sure that only good will result from a careful seasoning of our practice with the dictates of science. (1)

Mr. Gustaf Gylling, of the Fosbrooke, Farm Sorel, has my old Guernsey Bull—Rufus—for sale, as well as several heifers of his get out of Canadian cows. Rufus is from the now celebrated Vauxbelets herd, and when I saw him last was one of the handsomest Guernseys I ever met with. He has never been sick or sorry in his life.  
A. R. J. F.

#### EXPERIMENT WORK.

It is very gratifying to note the practical turn which the older state experiment stations are taking in their work. The New York experiment station, under the direction of Dr. Collier, is making preparations to enter upon a system of careful experiments with breeds of cows and other points in dairying. The Michigan station is already engaged upon experiments with breeds of cattle for beef, and it is soon to enter upon another series of experiments for the purpose of testing the merits of spayed heifers against unsplayed animals, and thus determine whether those spayed mature earlier or are ready for the shambles sooner than their unsplayed neighbors, (2) also whether they will produce a superior quality of meat in flavor and tenacity of fiber, or fatten better upon the same quantity of quality and food. The effect of the operation will also be tried on old cows to test its influence upon the meat, with the length of time required to effect the change; also influence upon the milk in quality as well as quantity.

It seems to us that these and similar experiments will be of vastly more benefit to the farming community than a dozen series of pot experiments upon plant life and growth with the most careful chemical analysis of all the elements which enter into their life and growth. We do not wish it to be understood that we favor dropping entirely the analytical part of state experiment stations, for we believe that the analysis of plants and plant food has its proper place in the work of a station; but we do believe that this part of the work should be made subordinate to what is of more practical value to our farming communities.

#### Corn Fodder Surer than Clover.

EDS. COUNTRY GENTLEMAN.—Mr. C. S. Rice (p. 304) makes a strong plea for clover as compared with fodder corn. I think he has made two grave mistakes. He estimates the first cutting of clover at two and a half tons per acre, which

(1) A very sensible article, written by a thoroughly educated practical Hertfordshire (Eng.) farmer.  
A. R. J. F.

(2) Not worth while trying, as we knew a hundred years ago that spayed heifers fatten faster for the operation.  
A. R. J. F.

is one ton or more above the average of the State; he claims that at the end of two years the soil is in a better condition for crops than before, while analyses show that three and a half tons of clover hay remove from the soil nearly as much plant food as five tons of timothy hay, which he estimates to be the value of an acre of corn fodder.

The difficulties with clover in Western New York have been to get a catch, the grub in the root, midge in the head, and the leaf beetle. If we get a catch, the beetles devour a portion of the leaves, the midge destroys the head, and the grub injures the roots so that the plants nearly all die before the second year's cutting. (1)

The average yield of corn fodder per acre may not be worth more than five tons of timothy hay, but corn for ensilage can be produced worth double that, or more, and the seed will not cost \$1, as 10 to 12 quarts is all the seed that should be used per acre. If the soil is in fair condition, it will produce 20 tons of corn fodder per acre, and each stalk will produce an ear or nubbin, and if cut and packed in silo about the time the ears commence to glaze, two tons of the ensilage will be equal to one of timothy hay. A soil which will produce three and a half tons of clover will produce more than twenty tons of fodder corn, which has never failed in this section, where clover has, a great many times.

Yates County, N. Y.

JAS. MILLER.

—TOP-PRICED BUTTER.—I venture to assert that anyone who has good sweet pasture, who keeps his dairy and every utensil in it scrupulously clean, who never churns cream more than sixty hours old from the cow, and always at the proper temperature, tested by a thermometer; who uses a proper churn (there are lots of them), ventilating his churn at intervals by taking out the plug, who stops churning the moment the butter shows itself in small grains not so large as wheat; who then lets the churn rest until the butter "all" floats up to the top, and then carefully lets out the butter milk and replaces it with clean cold water, turning it very slowly; who again lets the churn stop to let the butter float up and then lets out the milky water and replaces it with a fresh supply of cold water; who then gives the churn very few slow turns round and then a little faster so as to gather the butter into a sort of lump, and then lifts out the butter with a cloth over both hands, so as not to touch it, and then, when cool, works it with a proper butter-worker and never touches it with his hands, but only with "wooden-hands," will most assuredly make top-priced butter.—G. A. H.

People do not throng out of a state like Vermont, as they have done for thirty years, without some good reason. This emigration has gone on until now, if it is stayed at all, it is because farm property in the state is, in many places, practically unsalable at any price. When a people want to go badly, and yet can't go because they cannot sell, they are really getting in sight of a sort of bondage that is not many degrees removed from the serfage of the middle ages.

DR. HOSKINS.

#### SALES OF SHORTHORN DAIRY CATTLE.

Having written in terms of commendation of a herd of cattle, it is ever pleasing to the writer to find that his judgment is confirmed by the test of the sale ring. This was my experience on April 19th and 20th, when the cross-bred Shorthorn cattle at Storrs and Cleabarrow Farms, Bowditch, Windermere, were sold by Mr. Robinson Mitchell, of Cocker-mouth. At Storrs on the Thursday, the animals were all young, ranging from eighteen months up to three years; a

(1) Because you sow clover too often.

A. R. J. F.

few had calves at foot, and a few had been served. The animal had been picked up from the farmers' stocks in the district, and, being a select lot, they sold at an advance over what has been realised at farm sales, realising from £10 up to £20 each, the higher rates predominating.

On the Friday, at Cleabarrow, when the late Mrs. Scott's live stock was sold, there was a very large attendance, drawn from a wide radius, north and south, and from Wales. The competition, we think, was the keenest ever known at a sale of non-pedigree cattle, and the prices the most extraordinary, when we take into account the depression now ruling in the prices realised for live stock. There were two pedigree young cows, but their prices fell considerably short of those of the best of the cross-bred cows, one of the latter selling for £60. (1) So spirited was the bidding that Mr. Mitchell got through the fifty eight head of cattle and fifty sheep, with their lambs, in the space of two hours. Excluding twelve newly-dropped calves, the forty-six cows, heifers, calves, and one bull realised a total of £1,170 10s., or an average of £25 8s. 11d.

### Farming and Sheep Keeping.

EDS. COUNTRY GENTLEMAN—I am interested in keeping sheep for the threefold object of wool, lambs for market, and the improvement of my farm. I keep between 15 and 20 grade South-Downs. I allow them 25 acres of rather poor pasture during summer, and in winter feed clover hay and cornstalks, with some turnips and a little grain (corn and oats). My sheep are strong and in good condition the year round. They shear about five pounds each. Their lambs come in January and February, and are sold to local butchers in June and July at 6½ to 7½ cents per pound, and weigh from 60 to 90 pounds at that time. I think my flock is doing well, but my little farm is not getting better, but rather poorer from year to year. Can you advise me how I may make my sheep improve my farm?  
B. F. H.

Suffolk County, N. Y.

The answer to the above inquiry is this: You must help the sheep improve the farm. The flock and its owner must act together as partners in the work of improvement. This flock has good, intelligent care, but the flock must be increased. That 25 acres of pasture must be improved. Evidently it is not "natural grass land." There is great difference in the lands of Suffolk county, some being very good, while much is almost barren sand. I take it that this soil is improvable, and would suggest that the owner summer-fallow such portion each year as he may be able to do, if it be only one acre. Two plowings, with frequent harrowings, will do this. If some green crop is sown after the first plowing and turned under with the second, it will be of value. Buckwheat involves the least expense for this, but it adds comparatively little to the soil, although as much as any crop in proportion to its cost. Then, when the soil is brought to a good condition, sow a mixture of the following grasses, without any grain crop: Orchard, rye grass, Italian rye, meadow fox-tail and red-top. Kentucky blue-grass might be added. Be liberal with the amount of seed: At present prices it should cost about \$7 per acre. It is not necessary to insist upon any exact proportion of the varieties. Such manure should be harrowed in with the seed, as can be spared from other crops, if well rotted. It will be well to be liberal with this also, but I would not advise the purchase of commercial manures for the purpose. Compact the ground well with a roller, and do not let sheep upon the young grass until it has made a good

(1) This is the stamp of cow I have been begging some one to import for ten years,  
A. R. J. F.

growth and is well rooted. In the spring sow ten pounds of red clover seed to the acre. Keep on with this until the whole pasture has been reseeded. (1)

In the mean time the flock can be helped by soiling crops. Thickly-sown corn fodder makes excellent sheep food. The turnip crop might be increased, and mangolds will be very valuable for the ewes and lambs in the spring time. In Suffolk county, vetellés will be found very valuable for early winter feeding, keeping fresh there in most seasons until near mid-winter. (2)

The only outlay of money involved in the above recommendation is in the purchase of seed. The labor required will be profitably invested.

While the old Spanish adage is still true that "the sheep's foot turns the land into gold," it is also true that even a sheep "cannot make something out of nothing." As the improved pastures and the assisting crops give increased food, the number of the flock can be increased. Then the amount and value of the manure will be increased also, and this, in turn, will give more food until that "25 acres of rather poor pasture" should furnish the summer keep for 75 or 100 head of sheep. (3)

If wheat bran, oil meal and other foods are purchased, the advance can be more rapidly made. But it can be surely made without the purchase of foods or manure. The writer purchased, not long since, a tract of badly exhausted land, which he is treating in the manner indicated with very satisfactory results.

I would advise B. F. H. to push his lambs for market a little more rapidly, purchasing for this purpose, if necessary, wheat bran, oats and oil meal.  
J. W.

### The Holstein as a Butter Cow.

EDS. COUNTRY GENTLEMAN—Mr. A. L. Crosby is mistaken in thinking I did not take his criticism on a former article of mine kindly. He treated me fairly, and if anything in my reply indicated that his remarks were not kindly received I beg pardon of your readers, as no such feelings were entertained on my part. While I would avoid a war of words I enjoy reading a fair statement on both sides of such a question as the one under discussion. Whether cows may correctly be characterized as "inflexible," I will not attempt to decide, but will state a few facts, and then leave the subject to the consideration of those interested.

Only three dairies within my own immediate knowledge are made up Jersey grades. They are all situated so far from a cheese factory that it is inconvenient to draw the milk, and their owners, being good butter makers, obtained Jersey blood with the intention of making a permanent business of that branch of dairying. Two out of the three had just changed their stock when a change in the condition of their families made it necessary to give up butter making, and their milk is now drawn a long distance to the cheese factory. They have since obtained Holsteins. In neither of these dairies did the Jersey cross result in as great improvement in butter production as the Holsteins has in my own. I have one half-blood Jersey, a beautiful cow seven years old, that has taken a first premium at our country fair every year,

(1) The real cow grass, *trifolium pratense perenne*, would be better. I have just received a small lot of the above, with some genuine *Pacey's perennial ryegrass*. These I hope to get some careful farmer to grow for distribution. There is no charge for the seed, which is from Carter's, London, direct.  
A. R. J. F.

(2) Rape would fatten quicker.  
A. R. J. F.  
(3) Four sheep to the acre is pretty strong for rather poor pasture.  
A. R. J. F.  
Try two first.

of her life. She gives a little more than half as much milk as the five-year-old Holstein grades, and her milk will show only  $\frac{1}{3}$  of an inch more cream on a Cooley can than the average of the dairy. She eats as much as any of them, and can be bought for much less than the others. The truth is, not all Jerseys are great butter producers, and some families of Holsteins are excellent for that purpose. The dam of the first Holstein bull that I bought weighed 1,100 lbs., and had a record of  $87\frac{1}{2}$  lbs. of milk in a day, and her daughters a record of from 18 to 20  $1\frac{1}{2}$  16 lbs. of butter in a week, and the dam of the second bull recently purchased a record of 10 15 16 lbs. in a week when two years and one month old. The first cross with the Holstein added fifty per cent, to the value of my dairy for butter production. What the second will do remains to be tested.

I have no confidence in the argument based on the cost of keeping a large cow above that of a small one. When cows of the same weight not giving milk are fed alike, some will gain while others lose flesh. Of two pigs of like weight but of different breeding, one will thrive and the other eat and grow thin with the same amount of feed. Of two horses standing idle in winter and fed alike, one will gain and the other lose, although of the same weight. The doctrine is no more true in relation to cows than to men. Some small men require much more food than larger one. So much depends on constitution and disposition that the argument based on size alone is of little value. The largest ration on record I believe is charged to a Jersey cow. If any Holstein, large or small, has eaten as much I have not seen the account of it. I am satisfied with the Holstein cow, as her "flexibility" is such that she can be very profitably used for the "special purpose" of butter dairying, but I have no reason to receive unkindly any criticisms that may be made by those who prefer the Jersey.

C. S. RICE. *Lewis County, N. Y.*

#### Salt in Milk Production.

**EDS. COUNTRY GENTLEMAN**—Being interested in the articles in the dairy papers of late, relating to salting cattle and its effect on quality and quantity of milk, I should like to have from you and your readers experience in the matter—how much and how often it is advisable to give them, different modes of salting, and any arrangement or device in practical use.

*Lake Mills, Wis.*

#### SUBSCRIBER.

The cow is supposed to know how much salt she wants, and it is generally considered the best way to place salt within her reach in stable or field. For this purpose rock salt is best, as a lump of it may be placed in the manger where she can reach and lick it at will. When salt is thus placed within reach of the cow, she does not usually consume a large quantity—not more than two to four ounces a day. Some dairymen believe it profitable to give an extra amount of salt to their cows to induce them to drink a larger quantity of water.

Some experimenters have concluded that the quantity of water drunk by a cow was an indication of her yield of milk. M. Dancel's experiments, report to the French Academy of Sciences, showed that cows giving only from nine to twelve quarts of milk per day, on dry food, and what water they would naturally take, when their dry food was moistened with 18 to 23 quarts of water per day, gave from 12 to 14 quarts of milk, and he was accustomed to salt their food to induce thirst for water. He reported that cows which habitually

drank less than 27 quarts of water were poor milkers, giving only six to seven quarts per day, but those that drank as much as 50 quarts gave from 18 to 23 quarts of milk daily. But the experiments did not determine the real quality of the milk.

Prof. Horsfall, one of the most careful dairy experimenters in England, found that cows of the same weight drank much more water than fattening cattle, and he was curious to know what became of the extra water drunk by the cows. He found that cows giving 20 lbs. of milk per day, drank 40 lbs. of water more than fattening cattle of the same weight, and on examining the manure from the cattle and the cows, he found the moisture the same in the both cases. So he inferred that the extra water drunk by the cows was given off from the pores of the skin and the lungs.

Some dairymen have reported an increase in milk when the water was pumped into a trough and three ounces of salt per cow were dissolved in the water. The cows would go to the trough often and drink a few quarts, and the increase was said to have been five lbs. of milk per day. One party reported the use of four ounces of salt per day, but thought that was rather excessive, yet it is injurious, and two pounds of oil meal would be better.

An additional amount of water upon dry feed would probably produce more gain in quantity of milk than upon grass.

From our own experience, we think it better that the cows should have what salt and water they naturally desire. Any attempt to produce artificial thirst, to cause a larger consumption of water, will only act favorably for a short time, and it is profitable that an excess of water can add anything but quantity to the milk, and that the increased quantity of milk yielded would not be likely to produce any more cheese or butter. The quality of the milk is determined by the food.

E. W. S.

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