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NOTICE.—The subscription to the *Illustrated Journal of Agriculture*, for members of Agricultural and Horticultural Societies, as well as of Farmers Clubs, in the province of Quebec, is 30c annually, provided such subscription be forwarded through the secretaries of such societies.—**EDITORIAL MATTER.** All editorial matter should be addressed to A. B. Jenner Fust, No. 1 Lincoln Avenue, Dorchester Street West, Montreal—or to Ed. A. Barnard, Director of the *Journals of Agriculture, &c.*, Quebec.

OFFICIAL PART.

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It seems a pity that such a chance should not be made available and we trust to see the new faculty of Comparative Medicine avail itself of this vote.

Bois.

ERRATUM.

Page 23, February No., 2nd column, art. 134, read as follows :

(The Provincial Competition of Agricultural Merit shall be held in the district in 1892), instead of 1893.

Thoroughbred Pigs and Sheep.

Breeders of thoroughbred pigs and sheep are requested to forward to the undersigned, as quickly as possible, certificates of the entries of all the registered stock they possess, or of the direct descendants of animals thus registered; in order that these animals may be entered in the registers opened in virtue of article 19 of the rules of Council of Agriculture.

By Order: **ED. A. BARNARD,**
Secretary of the Council of Agriculture,
and Director of the *Journals of Agriculture.*

Thoroughbred Breeding-stock Wanted.

All breeders of thoroughbred stock, registered or entitled to registration, are requested to forward, as soon as possible, to the undersigned the certificates of pedigree they wish to be entered in the herd- and stud-books the government has opened for that purpose.

Those who offer such stock for sale, are requested to inform the undersigned of the conditions under which the said animals are offered for sale.

People are requested to observe that registered animals or

See—I see by the public accounts that a sum of \$2,200 was voted for assistance in the teaching of agriculture in this province, and for the want of an applicant for the fund it has not been tapped to the government.

Now that McGill college has established its faculty of Comparative Medicine with its staff of professors, would it not be well to establish in connection therewith a chair of practical agriculture.

Our English speaking farmers, at any rate in the neighbourhood of Montreal, would be able to learn some of the advantages to be obtained by the application of knowledge to their daily occupations.

The sum voted is too small of itself, but would be a material assistance in the case of a faculty already supplied with a staff of teachers and accomodation for the delivery of lectures.

those entitled to registration, are the only ones the Council of Agriculture allows the agricultural societies to hire or purchase; so it is useless to offer any others for sale through the *Journals of Agriculture*.

ED. A. BARNARD,
Secretary of the Council of Agriculture,
and Director of the *Journals of Agriculture*.

Quebec, April 9th, 1891.

Prizes offered for the best ensilage.

To the President of
The Agricultural Society of the County of P. Q.

Sir,—I have the honour to inform you that the Council of Agriculture offers the following prizes for distribution this year—from the present date, to 15th of December next—to those members of your society who shall, this year, build the best siloes and exhibit the best preserved samples of silage on the 1st December next:

- In the counties in which there is only one society, four prizes \$15.00, \$10.00, \$6.00, \$5 00
- In the counties in which there are two societies, three prizes to each..... \$8.00, \$6.00, \$4.00
- In the counties in which there are two subdivisions, A and B, to each..... \$10.00, \$6.00, \$4.00

Your society will have to name one or two judges to examine the siloes and silage, and to report upon them.

You will transmit to this department, on or before the 15th September next, the name and address of the judge or judges thus appointed, that we may send them a form of the report, in duplicate, that the judges will have to make; one copy for the agricultural society, the other for this department.

On receipt of this report, the amount of the prizes granted will be sent to your society, which will have no expenses to meet except the cost of the judges.

The department hopes that the agricultural societies will bestir themselves to second this enterprise, the usefulness of which is incontestable, and that the results obtained therefrom this year will be such as to encourage still greater efforts on the part of the government in the future.

I have the honour to be, Sir, Your obedient servant,
ED. A. BARNARD,
Secretary of the Council of Agriculture,
and Director of the *Journals of Agriculture*.

Competition of Agricultural Merit this year—1891.

THE DATE OF THE ENTRIES TO THE COMPETITION OF AGRICULTURAL MERIT HAS JUST BEEN POSTPONED TO THE 15TH MAY NEXT. Competitors are requested to hasten their entries as much as possible, as, after that date none will be accepted

Nitrate of Soda.

Enquiries are being made about nitrate of soda I know of none for sale here, except it may be at the Hamilton Powder Company, the secretary of which told me that the price was about 2 cents and a fraction a pound. Mr. Wm. Evans will supply it at \$2.25 per 100 lbs. in 200 lb. bags. This is cheap enough.
A. R. J. F.

Copy of the report of a Committee of the Hon. Executive Council, dated April 20th, 1891, approved by the Lt. Governor in Council, April 22nd, 1891.

CONCERNING ARBOR-DAY

No. 231.

The Hon. the President of the Council, in a memorandum, dated 20th April current (1891), recommends that a proclamation be issued fixing the following days for the celebration of Arbor-day, that is to say:

Wednesday May 6th next, for the Western part of the Province, including the following counties:

- Argenteuil, Bagot, Beauharnois, Berthier, Brome, Chambly, Châteauguay, Compton, Deux-Montagnes, Drummond, Hochelaga, Huntingdon, Iberville, Jacques-Cartier, Joliette, Laprairie, L'Assomption, Laval, Maskinongé, Missisquoi, Montcalm, Montreal, Napierville, Ottawa, Pontiac, Richelieu, Richmond, Rouville, Shefford, Sherbrooke, Soulanges, St. Hyacinthe, St. Jean, St. Maurice, Terrebonne, Three-Rivers, Vaudreuil, Verchères and Yamaska.

And Tuesday, May 19th, for the Eastern part of the Province, comprising the following counties:

- Beauce, Bellechasse, Bonaventure, Champlain, Charlevoix, Chicoutimi, Lac St. Jean, Saguenay, Dorchester, Arthabaska, Gaspé, Kamouraska, Lévis, L'Islet, Lotbinière, Matane, Mégantic, Montmagny, Montmorency, Nicolet, Portneuf, Quebec (County), Quebec (City), St. Sauveur, Wolfe, Rimouski and Témiscouata.

Certified true copy.

(Signed) GUSTAVE GRENIER,
Clerk of the Executive Council.

True copy.

(Signed) ED. A. BARNARD,
Secretary of the Council of Agriculture,
and Director of the *Journals of Agriculture*.

A MODEL STEADING.

Several of our readers, desirous of putting up convenient farm buildings, have asked our views and advice as to what constitutes a model steading for an ordinary sized farm of about 100 acres.

When we began farming, some 35 years ago, this problem had to be solved without delay. We gave it then, and have given it ever since, much thought and study. But the more we go, the more numerous the problems which crop up on all sides, where perfection is aimed at in important details.

In all countries where snow does not interfere greatly with stacks and where farm animals can consume root and other crops mainly where they grew, the question of what constitutes a model steading may be greatly simplified. Here, in Northern climes, where most crops must be housed, as well as all farm animals, for a number of cold, stormy winter months, this question becomes very complex. Before launching out into the study of details, it therefore seems best to examine carefully the principles which underlie this very important matter of intelligent farming.

WHAT IS WANTED.—We want our crops housed in perfect safety, where they can be easily reached at all seasons, at the lowest expenditure of time and money. As to our farm stock, it must all be kept in perfect health, and in such a manner that their owners obtain at the lowest cost the largest possible net returns. Such net returns are generally of a complex nature: take milk as an example. This may be turned

into butter or cheese. In both cases the outcome in the shape of skimmed milk or whey must be utilized, generally by being fed to other animals, such as pigs, poultry, &c. But in all cases, one most important chapter, in the net returns from animals, must treat of the full preservation of all manurial values, for future farm crops.

A PRELIMINARY QUESTION.—Should the whole crop and animals of a 100 acres farm be kept together in one place? As to animals there can hardly be any doubts, but not so as to crops. Our farms are generally so situated that in order to reach a single steading, a comparatively long distance must be travelled, at a time when minutes may be most valuable. Hay and grain crops may be partly ruined, under the best of care, in catchy seasons when rain falls unexpectedly and at such frequent intervals, that crops cannot all be saved. One or two small economical barns can be so placed as to enable us to save hay and grain crops in such circumstances, with great rapidity. These economical buildings will prove of considerable use in many occasions during the years besides this temporary housing of crops. With such help, the main building need not be so large or so expensive. This system also offers less danger of fire. This preliminary question, it strikes me, deserves fuller consideration than it generally obtains, especially on ordinary sized farms.

A CHEAP AND CONVENIENT ROOT CELLAR.—On an exceptionally well managed farm, which we visited lately we saw two such barns, so fitted that a large crop of potatoes were safely housed in economically laid basements, where advantage had been taken of the lay of the land so as to decrease the extent of side walls and yet unload most conveniently from the barn floor. A well protected double set of doors allowed of the crop being carried away at the lowest level and from the south side, whilst entrance was secured in the coldest weather from the barn floor above. A heavy coat of dry earth, between floors, prevented all danger of frost. Where large fruit crops have to be stored for a future market, such a style of economical cellars might prove advantageous. Having thus brushed off some preliminary points of considerable importance, we shall in a forthcoming article take up the question of a model steading for an ordinary stock farm.

ED. A. BARNARD.

Knowlton, March 20th 1891.

PROF. E. A. BARNARD, Director of the
Journals of Agriculture, Quebec.

My dear Sir,—It must be a source of gratification to the Agricultural Community of the Province of Quebec, as it is to myself, to notice the interest our Provincial Government is manifesting in the subject of agriculture. The farmers must necessarily be encouraged and receive a decided impetus, resulting in increased industry and energy to excel in their profession.

I refer more particularly to the offer of prizes for competition in Agricultural Merit, the establishing of herd registers, and the "Golden test" for cows making ten pounds or over of butter in one week. The latter must encourage farmers to feed better and breed better.

It occurs to me that the standard (10 lbs.) is too low, but if ultimately found to be so, it can be raised to 12 or 14 lbs. With your permission I would suggest that the columns of the Journal be opened for the publishing of tests, which shall be made according to form. Each test, so reported, should be accompanied with detailed statement as to age, breed, system of feeding, and account of food consumed.

I notice that the golden register is restricted to registered Canadian Cows, but with your permission I will here report a test of a Jersey cow, four years old this March, that had been fairly well wintered on a daily ration of

Hay 10 lbs.
Corn Meal..... 4 "
Bran 4 "

Dropped her last calf January 24th; for a few days previous the corn meal was withheld, but restored a few days after, and two pounds cotton seed meal added. On Tuesday March 19th, 6 P. M., she was milked dry and ration increased to, daily :

Hay..... 10 lbs. at \$8.50 per ton... .04.25
Corn meal..... 5 " 28.00 "07.00
Bran 5 " 18.00 "04.50
Cotton seed meal... 2 " 29.00 "02.90

Per day..... .18.65
7

Cost of ration per week..... \$1.30.55

Milk yield.

		lbs. oz.	lbs. oz.
March 11th	{ A. M. 14 12 P. M. 14 11 }	29	7
" 12	{ A. M. 16 1 P. M. 14 14 }	30	15
" 13	{ A. M. 14 14 P. M. 14 12 }	29	10
" 14	{ A. M. 16 15 P. M. 15 7 }	32	6
" 15	{ A. M. 16 3 P. M. 15 1 }	31	4
" 16	{ A. M. 15 5 P. M. 12 11 }	28	
" 17	{ A. M. 16 2 P. M. 15 1 }	31	3

Churned March 16th
7 lbs. 1 oz.

Churned
Mch. 19th 7 lbs.

Milk yield for week 212 13 Butter for w. 14 lbs. 1oz.
Sold at 25c.

Cost of food \$3.50
1.30

Net profit \$2.20

You will notice that this cow was not forced for a record but, fed purely for profit. I shall test all my cows while on grain and hay and again in June on grass.

I have the honor to be your obt. servt.,
E. P. STEVENS,
Secretary Brome Co. Agrl. Society.

Importance of good roads.

We call attention to the following paragraph, taken from *The Vermont Watchman* :

"In opening a new road to a market town, it is worth while to make every effort to have the grades as perfect as possible. A road opened in Vermont some ten years ago has probably saved the farmers along its ten-mile length forty per cent on the cost of hauling all their freight."

In our numerous journeys through the province, we have found, as a rule, the roads in the settlements most unwisely

laid. Even steep mountains had to be ascended with immense labor, to be descended and reascended again, whilst with a little attention nothing would have been easier than to trace a road on the slope, by which such ascents and descents might have been mostly all avoided.

Again, what a terrible amount of labor is wasted, from year's end and to year's end, from want of the proper care of roads.

When will this matter be attended to, so that good roads may be the rule? We fear that the only echo to this question, for a long time to come, will be: When?

ED. A. BARNARD.

Potato growing contest.

We are pleased to inform our readers that the NICHOLS CHEMICAL COMPANY offer two cash prizes of \$75 and \$25 for best and second best acre of potatoes—43,560 square feet—grown in the province of Quebec, with the aid of the Nichols Chemical Company's fertilizers only.

There is no entry fee. Those who wish to compete will simply notify the Company, or one of its regular agents, of their intention, when purchasing the needed fertilizers.

Professor Saunders has consented to act as judge in this competition and no better judge could be had than the very able Director of the Experimental Farms of Canada.

The largest crop wins. The money required to pay these prizes has already been deposited in the Eastern Townships Bank at Sherbrooke.

E. A. B.

Maple Sugar and Sugar Bush.

By Prof. Cook, of the Michigan State Agricultural College.

The following extract from an exchange, shows what revenue can be expected from a maple bush well cared for:

"A chapter of the profits of the sugar-bush demonstrates what a piece of rare good fortune is enjoyed by farmers who have a large orchard of maple-trees in their possession. Prof. Cook has about 600 trees, occupying about 20 acres of land. The capital invested, valuing the land at \$40 per acre, and adding up cost of house and all requisites to the business amounts to \$1,300. At 10 per cent interest, the expense so far would be \$130 per year. Wear and tear, wood and labor, bring up the annual cost to \$180. The value of each tree's

yield is variously estimated at from 40 to 50 cents. At the lower figure, there would be \$240 from the 600 trees. At the higher \$300. This margin, including as it does 10 per cent of capital invested, the Professor considers a very satisfactory showing, especially in these days of agricultural depression. Indeed he waxes quite eloquent over this point. "India," he says, "may close our foreign markets for wheat, and make the outlook for the wheat industry more dolorous than at present; the rich fertile West may flood the country with wheat, and make the cattle business non-paying; wool and mutton may sink even lower owing to the severe competition from Australia and California; but the maple sugar industry need fear no dangerous antagonism, no impoverishing competition." Make a careful note of this, all ye who have sugar-bushes."

OTTAWA, January 27.—The Minister of Agriculture has taken another important step to find a market for Canadian barley by instructions to have 400 bushels of Canadian grown barley of the two-rowed variety, known as the prize prolific, sent to England. Sir Charles Tupper has made arrangements to have this quantity malted and brewed into beer at one of the leading establishments of the mother country. It is then proposed to ask the committee of experts to fix its standard by practical tests. The barley is made up of samples from the Experimental farm and grown in different parts of the Dominion. It averages 52 pounds per bushel and is considered a nice bright sample. Better samples, however, might have been obtained if last season had been more favorably to barley growing. If satisfactory, Mr. Carling will lose no opportunity of demonstrating what Canada can do as a grain producing country.

INLAND REVENUE DEPARTMENT

FERTILISERS BULLETIN N° 22.

Mr. Macfarlane, the Chief analyst of the Dominion, has had the goodness to send me a copy of the above bulletin. In looking over it, I paid particular attention to the analyses of the fertilisers sent out by the Company at Capelton, with a view to comparing them to those made and published last year by M. l'abbé Choquette, of the Province of Quebec Experimental Station, St-Hyacinthe.

Brand.	Manufacturer's Statement.	Materials.	Selling price.
223 "The Reliance"	G. H. Nichols & Co., Capelton, P.Q.	Manufacturers.	Apatite, sulphuric acid, sulphate of ammonia, nitrate of soda and potash salts. \$27.00
224 "The Victor"	" "	"	" " 30.00
225 "The Royal Canadian"	" "	"	" " 38.00
226 "The Capelton Superphosphate"	" "	"	Apatite and sulphuric acid.
227 "No. 1 Superphosphate"	" "	"	" "

	Analyst's Statement.						Potash.		Moisture.		Real value.
	Am. = Nitrogen.	Ph. acid.	Sol.	Revert. insol.	Total.						
223 "The Reliance"—											
Guaranteed		2.00					6 to 7	2 to 3			
Found	2.34	2.84	6.74	1.78	2.60	11.12	8.52	2.10	12.97	21.54	
224 "The Victor"—											
Guaranteed		2 to 3					7 to 9	3 to 4			
Found	2.42	2.94	7.84	0.60	2.18	10.72	8.44	2.88	12.98	22.43	
225 "The Royal Canadian"—											
Guaranteed		4 to 5					9 to 11	5 to 6			
Found	3.85	4.68	8.97	0.79	1.29	11.05	9.76	6.90	11.37	32.14	
226 "The Capelton Superphosphate"—											
Guaranteed			10.95	1.28	2.15	14.38	8 to 10		16.04	17.85	
Found							12.23				
227 "No. 1 Superphosphate"—											
Guaranteed							11 to 14				
Found			12.18	0.80	1.86	18.84	12.98		28.10	18.83	

M. CHOQUETTE'S ANALYSIS AND VALUATION.

	Phos. acid soluble and reverted.	Ammonia.	Potash.	Sale price.	Real Value.	Difference in excess.
<i>Reliance</i>	%	%	%	A ton.		
Guaranteed	6 to 7	2.00	2 to 4			
Found	6 49	2.12	2 92	\$27.00	\$16 11	\$10.89
<i>Victor.</i>						
Guaranteed	7 to 9	2 to 2	3 to 4			
Found	7.22	3 32	5.05	30.00	17 76	12.24
<i>Royal Canadian.</i>						
Guaranteed	9 to 11	4 to 5	5 to 6			
Found	6.46	6 10	5 61	38.00	30.56	7.44

A remarkable difference will be observed in the two last tables; so great a difference that I am inclined to think one for the other of the Official analysts must have had badly selected samples sent him. For instance: M. Choquette makes the real value of the *Reliance* brand \$10.89 less than the selling price: Mr. Macfarlane makes it \$5.40 less. *Victor* brand, M. Choquette makes worth \$12.24 less than selling price; Mr. Macfarlane makes it \$7.57 less. *Royal Canadian*, M. Choquette makes \$7.44 less than selling price; Mr. Macfarlane, \$5.86 less.

Mr. Ewing, Seedsman, McGill Street, Montreal, has taken the agency for the sale of "Croft's Indian bone-meal," imported by Messrs. Lomer, Rohr, and Co., Montreal. This bone-meal, a sample of which I have by me, is of remarkably fine quality, as far as I can judge by inspection. It is really as fine as meal, and judging from the analysis, by Mr. Macfarlane, ought to answer well on any soil, but is more particularly adapted to the growth of roots on light land. I wish my friends would try a mixture of 250 lbs. of this bone-meal, with 120 lbs. of sulphate of ammonia for swedes, without any dung. The selling price of No. 4 is \$30.00 a ton.

	cts. per lb.
Nitrogen in Ammonia salts or nitrates.....	14(1)
Organic nitrogen in ground bone, fish, blood or tankage.	14(2)
Phosphoric acid soluble in water.....	7
" soluble in ammonia citrate.....	6½
" as contained in the Thomas phosphato powder	2½
" in ground bone and tankage.....	6
" in finely ground rock phosphate.....	2
Potash as contained in potashes or pearl ashes.....	7
" as contained in wood ashes.....	6
" as contained in high grade potash salts.....	5½
" as contained in kainite if imported in bulk.....	3½

Some of the fertilisers manufactured in Canada still leave much to be desired as regards their fineness and evenness.
A. R. J. F.

Manor House, St. Hilaire, 10 april 1891.

MY DEAR JENNER FUST.

I have read with interest and pleasure my friend Mr. Bouthillier's letter to you, published in the *Journal of Agriculture*, on the subject of horse breeding. Like him, I should like to see the Canadian pony bred from and improved, but I am afraid it is a very hard task. The present Canadian pony has been so intermixed with all sorts of blood, especially Clyde that he does not breed true any more, and is more a "lusus naturæ" than any thing else. I have as handsome and as high actioned a Canadian pony (mare 14.2), as there is in the Province of Quebec, from which I have bred 12 foals—not one a good pony, and I have put her to all kinds of stallions in the endeavour to get one.

From one *thoroughbred* sire, she threw a pony in *stature* only. From the same *thoroughbred* sire she threw a 15.2 mare. From another *thoroughbred* sire (and a small one: 15 hands), she threw a 14.2 small horse. From same sire a 15 hands mare. From, again, a different *thoroughbred* she threw a 15.1 mare. From a Canadian pony sire (13.3) she threw a nondescript weed, 14.3. From another Canadian sire (14.3) she threw a common, ill-looking plug 15 hands. The pony mare I speak of has very good shoulders, but no withers, and you have not much in front of you when riding, and still she is a most comfortable pony to ride and a good fencer; my brother Captain Campbell followed the Montreal

	Nitrogen as ammonia	Phos. acid.	Moisture.	Real value.
243 "Croft's Indian Bone Meal" No. 4—				
Guaranteed.....	4 to 5	23 to 25 03		
Found	3.75 4.56	10.50 10.33 20.83 20.83	7.01	26.54
244 "Croft's Indian Bone Meal" No. 5—				
Guaranteed.....	3½ to 4	20.07 to 23		
Found	3.30 4.01	12.30 4.30 16.60 16 60	6.22	30.39

I was going to say that I was surprised to see that not more than 3,400 tons of artificial manures were sold in the Dominion last year: I should have said *sorry*, not surprised. In the States, considerably more than a million tons were employed by the farmers, more than 300 times as much as in our Dominion, "though the prices here are, on the whole, lower than they are across the lines."

The following table of values of fertiliser-ingredients in the Canadian wholesale market is given by Mr. Macfarlane, and varies very little from one I gave only the other day:

fox-hounds with her and I dare say my friend Mr. Bouthillier will recognise the well known "Margot."

What we require for the ordinary mares out here is no doubt the *thoroughbred* sire: but I have done my best by keeping 3 different *thoroughbred* stallions at a nominal fee—with little success as far as the *habitans* went—I think a horse that might succeed out here is the Anglo-Norman, magnificent specimens of which I saw at Mr. Beaubien's at Ou-

(1) Mr. Evans' ni. soda @ \$2 25 = nitrogen at 16% = 14½ a pound.
(2) Tankage is the waste, &c, of the abattoirs.

tromont. He has a good deal of thoroughbred blood in him, and being heavier would take better with the *habitans* who prefer heavy horses. The Anglo-Norman ought to nick well with the Canadian mares that have any of the good old St. Laurent blood in them, for the Anglo-Norman is very much the same stamp of a horse, especially the good loins and croup; also colour, dark brown with tan nuzzle—both rather inclined, though, to a hollow back—More, anon, from.

Yours very truly, A. G. CAMPBELL.

OUR ENGRAVINGS.

A flock of lovely Shropshire-sheep, much less unlike real ones than they are generally depicted in American publications. *Norman Cattle*, v. p. 75.

Land-plaster.—Mr. Maltby, who tells me that he has secured a monopoly of all the land plaster in the country, is prepared to sell it at 90 cents a barrel, of 280 lbs, package included. This is equal to about \$6.30 a ton, which is a reasonable price enough.

NITRATE OF SODA.

Thirty-eight years ago, last May, I, for the first time, made an essay on the value of nitrate of soda as a top-dressing in the spring for wheat. The piece of land on which the crop experimented on was growing was eleven acres imperial in superficities; it had grown the previous year a heavy crop of trefoil—hop-clover,—which had been cut for seed, after being fed off in the early summer by sheep; the autumn was a wet one, so wet that many thousand acres of heavy land in the south of England, intended to be put in with wheat, were left for oats in the spring; but, fortunately, the soil was gravelly, and so I managed by dint of watchfulness to get the piece ploughed, thoroughly harrowed, and the seed—4 pecks to the acre—sown, with the Woburn drill, 7 inches between the rows. by the 20th October, 1852.

The seed was Chidhan. white-wheat, costing me 36s a quarter = \$1.10 a bushel. It came up well, and the plant in the spring was perfect. In March, the whole piece was well harrowed with Howard's medium harrows; a fortnight or so afterwards it was rolled with a 4 horse roller weighing about 3,600 lbs, then horse-hoed with Smith's horse-hoe, doing about 8 acres a day, and, finally, rolled again with Crosskill's *clod-crus* roller, weight about 2,000 lbs.

Immediately after the last rolling, 50 lbs. an acre of finely pulverised nitrate of soda was sown very carefully on a damp morning, and the same quantity was administered 15 days afterwards. The crop stood up well till harvest, and when cut, was threshed from the shock, without stacking, and yielded of thoroughly dressed wheat, exactly 52 bushels an acre, which, in consequence of the rumours ending in the Crimean war, brought me in 84s a quarter = \$140 an acre. How much of this great yield was due to the nitrate of soda I cannot exactly tell, as, unfortunately, I did not, as I ought to have done, leave a measured plot unmanured; but the crop was so much superior to that of my neighbour on the same soil, that I am confident I gained at least ten bushels an acre by the use of the trifling quantity of 100 lbs. an acre of nitrate, which I think paid for its cost: less than two dollars!

Ever since that autumn I have been a thorough believer in the value of this handy manure, though, in this country, I

have generally recommended sulphate of ammonia as a source of nitrogen, since it can be the more easily procured.

You will not, of course, imagine that 100 lbs. of either nitrate of soda, or, about its equivalent, 80 lbs. of sulphate of ammonia, will have the effect of adding 10 bushels of wheat to the product of an acre of land worn out by repeated sowings of grain-crops without manure. It will do nothing of the sort. But, if your land has been fairly cultivated and fairly manured, you may safely expend say from \$2.00 to \$2.50 an acre in either of these manures over the whole of your grain-crops. The sulphate of ammonia should be harrowed in with the seed; the nitrate of soda sown broadcast in damp weather, at two sowings with ten days between them, after the crop is well up.

And to those of our people who grow root-crops, I beg to say that it is quite a mistake to suppose that mangels and swedes cannot be grown without farmyard dung. Here, the use of nitrogen alone would, except on rich, highly manured soils, be injudicious; but, combined with other fertilising materials, these two really cheap though nominally expensive manures, nitrate of soda and sulphate of ammonia, are capable of producing satisfactory returns on almost any soil. Root-crops require, in addition to nitrogen, phosphoric acid, and potash, considerable amounts of lime and other minerals, all of which must not only be present in the soil on which they are grown, but must be present in an available form. If any authority on agricultural chemistry says that roots can do without nitrogen, if they only get phosphoric acid enough, he must mean that some soils, in a high state of fertility, may contain nitric acid sufficient for the use of the crop. There was a time, some 45 years ago, when it was supposed that the broad leaves of the swedes and mangels were specially intended by Providence to enable those plants to absorb the free nitrogen of the atmosphere but this notion has been long abandoned.

Sir John Lawes, who is still carrying on his invaluable experiments at Rothamsted, is at the present time growing mangels on a piece of land which has borne root-crops for many years, and 4 or 5 tons an acre are all that he can obtain by a liberal supply of all the necessary minerals without any addition of nitrogen. But when nitrogen is added what follows? An additional growth of double the weight? Of thrice the weight? More than that, a great deal; for last year, when rape-cake and sulphate of ammonia were used as sources of nitrogen, the yield of the best plots was no less than 36 tons an acre! Sounds like a fairy-tale doesn't it?

Again; where nitrate of soda was used with the minerals, supplying only half the amount of nitrogen contained in the rape-cake and sulphate of ammonia, 20 tons an acre were grown, and the crop of this year is quite as good as, if not better than, last year's crop, the treatment being the same.

Hence, to get at the increase due to the nitrogen, we must deduct the weight of the roots grown with the minerals alone from that of the roots grown with the minerals *plus* the nitrogen.

Another curious, and to me most unaccountable fact, brought out by these long continued experiments of Lawes is, that though superphosphate and nitrate of soda alone grew as large a crop of mangels as they do when a large addition of potash is made, such is by no means the case when an equivalent amount of nitrogen in the form of sulphate of ammonia is substituted, for in that case many more tons to the acre are yielded.

"Whether," says Sir John, "the superior action of nitrogen in nitrate of soda is due to its more rapid diffusion through the soil, and whether a much earlier application of salts of ammonia (say a month before the seed is sown), would pro-

duce a great effect, are questions not yet solved; but, at all events, a thunderstorm in July, 1889, during which about 3 in. of rain fell, and which must have washed out considerable quantities of nitrate, did not prevent the roots manured with nitrate being heavier than those manured with ammonia. It is not easy to explain why nitrate of soda and superphosphate, without potash, can continue for so many years to produce crops equal in weight to those grown by the same manures with potash. As soda is not found in the ripe seed, however abundant it may be in the growing plant, it is tolerably evident that it cannot take the place of potash in some of its more important functions. Even in the potato we find no soda, nor does nitrate of soda show any superiority over salt of ammonia as a manure to this crop. Although nitrate has a marked influence upon pastures, cereal crops, and roots, its action is most uncertain upon leguminous crops; it should not, therefore, be employed for them."

Of course, on cereal crops in wet summers, an exhibition of nitrogen in any form is likely, on rich land, to cause a superabundant growth of straw, but that is an event not likely to occur frequently in this country, in spite of the bad example of the two past seasons.

Another result of the Rothamsted experiments relates to the different capacity between two different species of plants for availing themselves of the minerals existing in the soil: this was illustrated in the unmanured rotation experiment, begun in 1848, the swedes giving a large crop—if I remember, 18 tons an acre—the first year. The rotation was the old Norfolk or four-course shift:

1st year.....	swedes;
2nd ".....	barley;
3rd ".....	$\frac{1}{2}$ clover
4th ".....	$\frac{1}{2}$ pulse
wheat. (1)

Since 1848, the swedes sown every fourth year, although the plant has been invariably good—they come up well,—have quite failed to produce a crop of any value; in fact, they have formed no bulbs at all. The unmanured wheat and barley, on the other hand, have all through this period of more than 40 years produced fair crops, averaging 30 bushels of barley and 28 bushels of wheat to the acre. Observe, please, that this experimental piece of land has received absolutely no manure at all for 43 years, and yet, in spite of every thing, it has produced an average crop of wheat more than double that of the highly vaunted soils of the Western States of our neighbours. Why? Because the land is well farmed and kept perfectly clean. For further consideration, on this subject, see Journal p. 130, 1887; and p. 20, 1888.

Fattening lambs.—In bulletin 51, Mr. Thos Shaw, Professor of Agriculture in the Agricultural College at Guelph, gives a lively description of a most successful experiment of feeding lambs on rape. The lambs seem to have been treated in Lincolnshire fashion, that is turned loose into the rape-field as into a pasture. If treated in this fashion, at least one-third of the produce will be lost, and the sheep will not do so well. The land, too, does not get an equal share of dressing, as sheep are sure to choose their own reposing places—the same place night after night,—and in the day-time they invariably select the fence-side for lying down.

Now, all these inconveniences are obviated by the use of nets or hurdles. A full description of this system of feeding of rape may be found in the numbers of the Journal for 1884, pp. 36, 130, 178; and an engraving (from a very bad photograph) of the sheep feeding off the last fold of it, on the Lincoln College farm at Sorel, is given at p. 184 of the same volume. Those lambs in the fold, which were miserably poor when they were bought, were fed for 10 weeks, from September 28th to December 7th, on nothing but rape and a pint of oats, with a few peas among them, a head, per diem. Had I had any clover-hay, I should have added some to their daily rations as soon as the frosty mornings began, for a pretty long experience has taught me that there is no use offering sheep chaffs on otherwise full food, until cold weather sets in. A taste or so of cottonseed-cake would have pushed them on faster, but as it was they did well enough, for they were all—43 in number slaughtered immediately on leaving the rape-field—after fasting of course—and so good were they, that a saddle was sent to the Manager of the Molson's Bank at Montreal as a specimen. The extent of land sown in rape was $3\frac{1}{2}$ acres.

If Mr. Shaw should think fit to continue this system, will he allow me to suggest that instead of farmyard dung, a small dressing of bone dust from unboiled bones—be applied. Eight bushels of bones, with, perhaps, a dash, say, 100 lbs, of sulphate of ammonia would do wonders for this crop. I presume that, in future, the sheep will be got on to the rape earlier in the year, and finished off thereon. I should very much like to know what was the yield of the grain crop after the rape. At Sorel, it was very large, but, unfortunately, I have no account of the measured yield.

I do not hesitate to say that an acre of rape, broadcasted at the rate of, say, 7 lbs to the acre, on good ordinary land, will, with the aid of a little extra food, fatten ten lambs in less than three months.

I would not drill rape: broadcasted it renders hoeing—always a bother to get done here—unnecessary, and the plant is so heavy and umbrageous that when sown thickly not a weed can grow.

Coleseed, which is half-brother to rape, is preferred by the great Cambridgeshire flockmaster. Sussex men sow rape. I think one is as good as the other.

As to the results of the experiments at Guelph, they were perfectly satisfactory, except with regard to the waste of food: 'the eight acres of rape would have well sustained 70 to 80 lambs during the period of pasturing, as much of it was still uneaten when the lambs were removed. The crop was fair in the valleys, but light on the hills.' Mr. Shaw may depend upon this: if 8 acres of rape "pastured" will keep 70 to 80 lambs for 62 days, the same superficies would keep at least 100 if folded off, a fresh piece being given every two days. Wood is cheap, and it does not require much labour to make a rolling hurdle ten feet long. Two folds are required, one to fall back upon in case of very wet weather, but there must be lots of shepherds at Guelph who understand the system of feeding off roots, &c. The only inconvenience attaching to these rolling hurdles is that small lambs, such as we have in this province, get out at the corners of the fold. This is easily obviated by a few turn of wire or rope round the legs of the hurdles. A fold for 100 sheep on a fair crop can be shifted in less than half an hour by a man and a boy.

I admire the perfect fairness exhibited in the annexed table of results; but, in my opinion, the average gain of the lambs should be given as up to the 3rd December, for during the "7 days they spent in the shed" up to the 10th of December, the change from a succulent food like rape to the shed-feeding, would, in spite of the turnips given, effectually

(1) This must not be confounded with the experimental plots on which wheat has been sown for 48 years consecutively.

stop the improvement of the lambs even if it did not cause them to fall off a little in flesh.

I most devoutly hope that this is only a beginning of the practice to which my part of England at least is indebted for its marvellous crops of grain from the very poorest clay soils. The East-Hills of Kent and the adjoining counties are so full of flints on the top-soil that no modern implement of husbandry can be used on them. A summer—or rather a bastard-fallow—is made after the last grain-crop of the season, by means of the 4-horse turn-ree (or turn-wrest) plough; rape is sown, fed off with sheep, and the wheat-crop, sown in October, often yields from 36 to 44 bushels an acre. What the quality of the land is may be judged of from the rent: about 7s or 10s an acre, and that within 20 miles of London.

As for water provided for sheep, they may require it in hot weather on a dry pasture, but on rape, never. I have often shot partridges in rape, on the Kentish Hill. when, in September, it stood as high as the hurdles: three feet six inches. The birds lay like stones; the only trouble was to find them after they were shot, which rendered a steady retriever invaluable.

RESULTS FROM FEEDING ON THE RAPE.

Aggregate weight of 48 lambs at the commencement of the experiment, October 10th....	4,612 lb.
Aggregate weight December 10th, a period of 62 days, of which the last 7 days were spent in the sheds.....	5,476 lbs.
Aggregate gain.....	864 lbs.
Average weight at commencement.....	96 "
Average weight at close.....	114 "
Average gain in 62 days.....	18 "
Average gain per month.....	9 "
Average gain per lamb per day.....	.29 "

Price paid for 48 lambs, October 9th, the date of purchase.....	\$ 184 70
Average price paid per head.....	3 84 4/5
Price paid per pound live weight.....	04
Estimated value of 48 lambs, December 10.....	273 80
Estimated average value.....	5 70 5/12
Estimated value per pound live weight.....	05
Aggregate increase in value in 62 days.....	89 10
Average increase in value.....	1 85 5/8

Grass-seed.—A correspondent of note in Montreal, proposes to break up 30 acres of worn out pasture, by the side of the Lachine canal, and after growing one crop of grain, to be followed by a hoed-crop of some kind—roots or corn—to lay it down again in grass. He has consulted me as to the most proper seeds to sow in such a situation. In his place, I should take the following:

Fiorin— <i>agrostis stolonifera</i> (?).....	3 lbs.
Redtop—“ <i>vulgaris</i>	3
Tall Fescue— <i>festuca elatior</i>	2
Meadow Fescue— <i>festuca pratensis</i> (?).....	2½
Fowl meadow-grass— <i>poa scrotina</i>	3
Meadow foxtail— <i>alopecurus pratensis</i>	3
Timothy— <i>phleum pratense</i>	6
Orchard-grass— <i>dactylis glomerata</i>	6
Perennial Red-clover— <i>trifolium pratense</i>	4
White-clover— <i>trifolium repens</i>	2
	34½ lbs.

Mr. Evans knows where to obtain the perennial red-clover, the most difficult of all clovers to get true to sort. I have omitted my favourite Pacey's perennial ryegrass, as I do not think it would answer in such a damp locality as the one above mentioned: The Red-top, Fowl meadow, Fiorin, and Tall fescue, have, to my knowledge, answered well in a similar situation and climate.

As the land is intended eventually for pasture. I hope the farmer-tenant will not wear it out by frequent mowing for hay before he devotes it to its real purpose. One great advantage of these mixed-grass meadows is, that they may be grazed by stock both before and after mowing.

I need hardly say that as the grass is desired to remain down as long as possible, the hay-crop should be cut before there is the slightest sign of any of the grasses going to seed. In fact, the first year it cannot be cut too early.

Fall-ploughing.—A discussion arose the other day, at a meeting of the New-York farmers's club, as to the question, "Is fall-ploughing profitable?"

The secretary, Mr. Woodward remarked that "he did not believe in fall-ploughing. There is a loss of fertility by it." To this purely theoretical objection. Col. Curtis replied: "There can be no loss of fertility, to amount to any thing, by ploughing any kind of clay or loam land late in the autumn. The advantages will more than make up for any possible loss."

What Mr. Woodward intended to explain was that owing to the rain and melted snow carrying with them the elements of fertility with greater ease through a ploughed surface than through a whole, unbroken one, it would be better to defer the ploughing to the spring. But, practically, this loss of fertility, as Col. Curtis sensibly says, does not "amount to any thing" for as Sir John Lawes remarks, speaking of this subject: "We always have applied, on one of our experimental plots, the whole of the sulphate of ammonia in the autumn before sowing the wheat, to compare it with other plots on which the same fertiliser is applied in the spring. This ammonia nitrifies very rapidly in the soil, and a very few days after its application, if there is rain, nitric acid will be found in the water of drainage. The winter of '89, '90 was dry, and less water passed through our drains than usual, and though considerable quantities of nitric acid must have been lost, the wheat growing upon the plot where the manure was autumn sown, gave a larger crop than were it was spring sown."

As I have remarked several times before, if the furrows of the autumn ploughing are made wide and shallow, very little good will be derived from it, for, to do any spring-work properly on it, another ploughing when that season arrives will be necessary, the grubber not being able to take the place of the plough without it. But, where the furrows have been laid up at an angle of 45°—10 inches by 7, say—the rain and snow-water will find it a hard job to batter such work down, the harrows and the grubber will easily complete the work of the frost, and the grain will find itself in a seed-bed as fine, to use our Kentish expression, as an ash-heap.

Even Mr. Woodward confesses that: "If I had a field that was wet, I would plough it in the fall? On which amended conclusion Col. Curtis observes: "I am glad the secretary is half-converted."

"What is the reason straw kept in a stack is better than straw kept in a barn?"

Col. Curtis: Because the stack has the aroma of the west-wind."

Dear me! It is clear that Col. Curtis has never hunted rats in a barn-bay full of straw. I have, many a dozen times. I don't know anything about the "aroma of the west wind," but I do know that the saw in the barn is in a close, almost air-tight place, and the straw in the stack allows every breeze

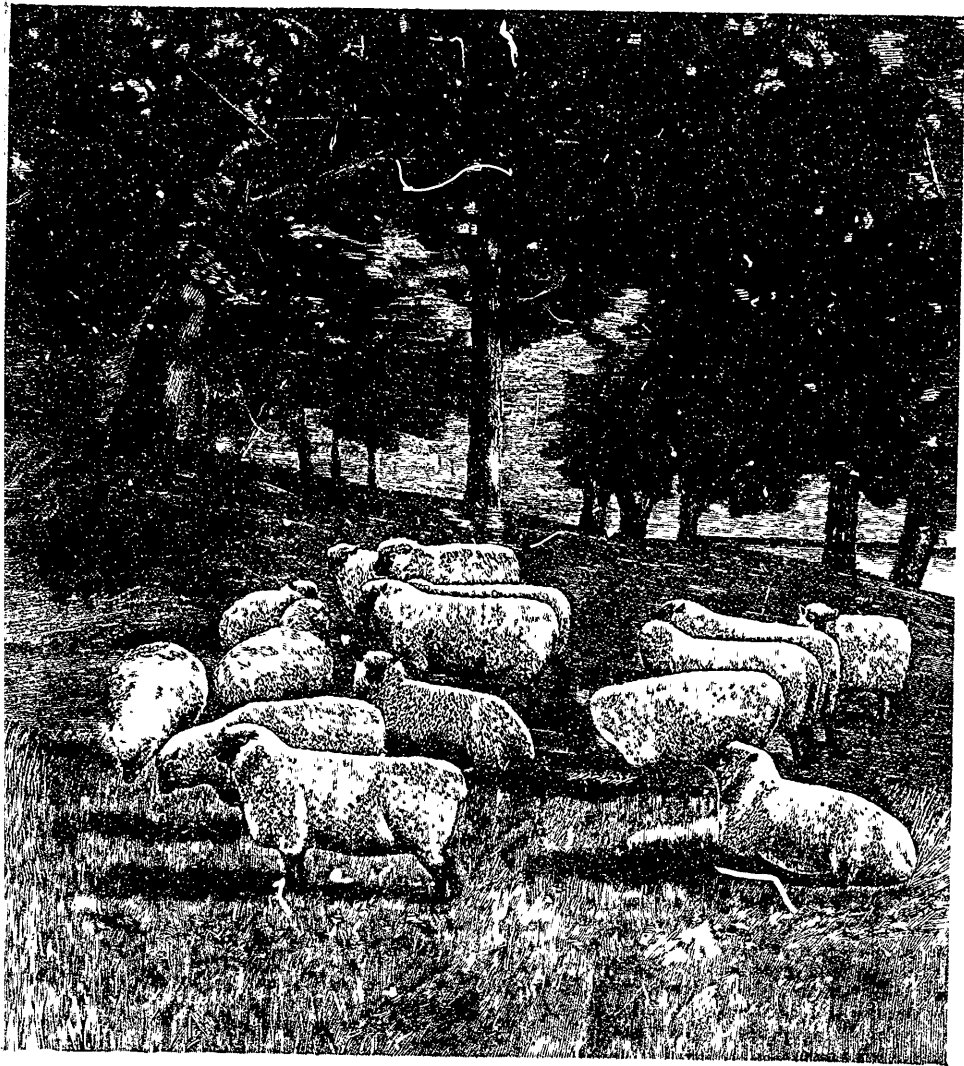
to blow more or less through it. One lot always smell musty; the other comes out when wanted as "sweet as a nut."

"How old should cows be kept for profit?"

Col. Curtis—It depends on their constitution, condition, and ability to masticate and digest food. I have found that

pretty price beef would be! Do they give away their old cows in the State of New-York? Then no wonder they cannot compete with the beef-growers of the Western States.

One of the most profitable pieces of business I know, is the fattening of good milch-cows as they are nearing the end of



GROUP OF SHROPSHIRE AT WOODSTOCK, OREGON.

there is no profit in attempting to fatten old cows in these times. It is better to milk a cow as long as she is useful and then give her away. Good thoroughbred cows can be kept as long as they will breed.

What has the poor labourer done that he should have no chance of buying cheap beef? Give a cow away! Why if we in England gave our cows away, instead of fattening them, a

their milking-season; but in order to carry this out fully, the cow to be fattened must not be allowed to fall off in condition at any time, neither must she be in-calf. Fortunately for the English dairy farmer, his cows are, $\frac{9}{10}$ of them, shorthorn-grades, which not only give an abundance of milk, but are easily kept in good condition, if a fair allowance of bean- or pease-meal is mixed with their other food.

The following table, taken from E. W. Stewart's book on Feeding Animals, will give some idea of our general practice in treating cows that are not thought worthy of continuing the reproduction of their race. The cow-keeper was Mr. Horsfall, one of the largest of that tribe in the neighbourhood of London:

No. of cow.	When calved.	Greatest yield per diem.		Weight October 8th.	Weight March 4th.	Average yield per diem.		Total yield.	Gain in weight.
		lbs.	lbs.	lbs.	lbs.	days	lbs.	lbs.	
1	July 20	30 $\frac{3}{4}$	1,064	1,148	25 $\frac{1}{2}$	203	5,202	84	
2	Aug 25	46 $\frac{1}{4}$	1,120	1,260	41	189	7,749	140	
4	July 28	46 $\frac{1}{4}$	952	1,120	38 $\frac{1}{2}$	217	8,354	168	
6	Sept. 8	41	1,176	1,204	38 $\frac{1}{2}$	175	6,725	22	
7	Sept. 8	41	1,176	1,232	38 $\frac{1}{2}$	175	5,833	56	
11	Aug 25	41	1,036	1,064	34 $\frac{1}{2}$	189	6,652	28	
Average.		41 $\frac{1}{2}$	1,087 $\frac{1}{2}$	1,171 $\frac{1}{2}$	35 $\frac{1}{2}$	191	6,752 $\frac{84}{100}$	at 12 c. \$10 08.	

As will be seen by the subjoined food-supply, the rations were highly nitrogenous:

Per cow per diem :		lbs.	Digestible Albuminoids	9.2 per cent
Meadow hay.....	9 $\frac{1}{2}$	"	"	25.3 " "
Rape-cake.....	5	"	"	20 8 " "
Malt-combs.....	1 $\frac{1}{2}$	"	"	10.0 " "
Bran.....	1 $\frac{1}{2}$	"	"	23.0 " "
Bean-meal.....	1 $\frac{1}{2}$	"	"	1.3 " "
Roots, &c.....	34	"	"	1.4 " "
Oat-straw.....	8 $\frac{1}{2}$	"	"	5.0 " "
Horse-Bean-straw.	2	"	"	

62 $\frac{1}{2}$

This, as Mr. Stewart justly observes, "costing 27 cents a day, was a pretty large price for keeping; but the milk, at two pence (3.7 cts.) a quart left the handsome margin of \$46.83 per cow."

I hope, with all my heart, that the Premier of the province, M. Mercier, will, during his tour in Europe, visit, in his capacity of minister of Agriculture, some of the dairy-shorthorn herds of England, and see what these noble animals really are.

And with such feeding as this, I think we may fairly calculate that 22 pounds of milk would produce a pound of butter, which would amount in the 191 days to $67\frac{5}{2} \times 2 = 306$ lbs., really, *pace* Dr Hoskins, not bad work for a "beef-breed"

The manure of these cows was analysed, and was calculated to be worth about \$17.28 per head for the 191 days. Stewart's valuation makes it to be worth \$30.00; but he estimates it according to the valuation of commercial fertilisers in the States. Nobody, I should hope, will follow him out in this, as it is clear to any thinker that at least $\frac{1}{3}$ of the elements of fertility of dung, in spite of all the pains we may take to preserve it, must infallibly be lost before they are appropriated by the crops.

Thus, we see that, taking the value of the milk of Mr. Horsfall's cows at only one cent a pound, the total gross value of the average produce of his six cows was for the 191 days.

6,752 lbs. at 1 cent =	\$67 52
Manure =	17 28
84 lbs. meat at 12 =	10 08
	<hr/>
	94 88
From which deduct keep for 191 days at 27 cents...	51 57

And we have the pleasant balance to good of. \$43 31

for little more than half a years feeding. Seems to be profitable, doesn't it?

Do they give away their full-mouthed ewes in the States? We don't: After taking three crops of lambs, from them, that is, when they are full-mouthed sheep, the ewes in the Down-country are sold to the inland farmers, who after taking them home in August, put them at once to the ram, lamb them down in February, send the lambs to market at Easter or a little after that feast, and the ewes themselves are slaughtered a fortnight or three weeks later. This is called, in my country, *fattening lamb and dam*, and, when a good shepherd has the management of the flock, is one of the most profitable branches of farming.

As I have often remarked in this periodical; a curious thing is the London market. Easter-lamb always fetches a good price, but an early Easter is not so good for the sale as a late one, and the reason is peculiar: there is no lettuce to make salad of; so that, strange as it may seem, lamb actually siloes higher in May than in April!

In this double-fattening, both parent and offspring get anything they like to eat, care being taken that when the lambs are about ready to go off, the food of the ewes is restricted to linseed-cake, roots, and clover-chaff, for fear of garget of the udder, or other feverish complaints coming on. In fact, the lambs should only suck once or at most twice a day for a week before going to market and a careful shepherd will milk his ewes for a few days after the severance, drying them off as would be done with cows.

I have had my Hampshire-down ewes die 13 stone (26 lbs. a quarter) within a fortnight after their twin-lambs have left them at Easter, the latter weighing about 4 $\frac{1}{2}$ stone = 36 lbs. the carcass. When I see the wretched little *cats* of things weighing some 4 lbs. at most a quarter, and as flabby in the texture of the meat as the American hare, hanging up in the Montreal butchers' shops, and hear that they cost \$5 to \$6 a piece, in April and May, I cannot help heaving a sigh over the short sightedness of some of my Sorel friends who lamb down their ewes in early March and keep the lambs on till October, to sell them at last for from \$2.50 to \$3.00 a head. (This, with my compliments, to Monsieur, M. le Majeur Paul, Ste-Anne de Sorel.)

The lambs, in the case I am speaking of, are allowed a separate trough of *white-pease*, and to prevent the ewes getting at it, holes are left, in making the division fence, through which the young ones can creep. No fear of flabby meat where pease are given. I have often thought how the addition of a few pounds of pease-meal a day would improve the soft meat of our distillery-fed oxen. Pease are thought to be too heating for the ewes while suckling their lambs.

Hampshire-downs at the Smithfield Club.—As it was with my favourite breed of cattle, the noble Shorthorns, so it was with my favourite breed, or rather race, of sheep, the noble Hampshire-downs. The former won the Champion-plate for the best animals in all the cattle classes; the latter won the Champion-plate for the best pen of animals in the short-wooled sheep classes.

Mr. Wm Newton's Hampshire-down *wethers*, 22 months and 2 weeks, averaged 280 $\frac{3}{4}$ lbs., having, therefore, made 32 lbs. of live-weight a week from their birth, deducting, of course, what they weighed at parturition. Mr. Newton's third-prize sheep, exceeded the Champions in weight, but were not as neat in form. His ewes, which also won the first prize, are said to have been very good in character.

There were eleven pens—33 sheep—of lambs shown, Mr. Newton taking first and second prizes with lambs "showing size (236 lbs. each) and quality, big legs of mutton, grand backs, and handling like wethers"—better than those from

the same flock which took the cup—the first prize pen of lambs standing second honour for that.

Southdowns.—Strange to say, Mr. Toop's lambs won the prize-breed-oup as the best pen of Southdown sheep or lambs: "A grand lot of lambs, handling like wethers *that is with great firmness of flesh,* and weighing 4 cwt. 1 qr. 22 lbs., the pen of three." That makes the individual weight 23½ lbs, less that the weight of the Hampshire-down lambs of Mr. Newton, but they were reserved in the Champion contest for short-wools.

Long-wooled sheep.—The Champion-price for long-wools went to a pen of Lincoln wethers, though Mr Russell Swanwick, who rents the Cirencester College-farm, ran them very close with his Cotswolds. Well, I could eat Cotswold mutton, if I were hard put to it, but a Lincoln! The prize pen weighed just 300 lbs, a head, "and if one of the three had been as good as his brothers, the lot would have weighed a good deal more."

Cross-bred sheep.—The observations of the English Agricultural Gazette on the cross-breeds I give *in extenso*. It will be observed that with the exception of one third-prize, that went to Scotland, all the honours go to sheep that are either half—or two-thirds Hampshire-downs; the Oxfordshires are, as every one know, the Cotswold and Hampshire-down cross instituted and carried out by the late Mr. Druce of Bynsham:

CROSS-BREDS.

Cross-bred sheep usually make a grand mark at this show, and they have done so now, more especially as some of the exhibitors who have in the past been accustomed to carry all before them have found the fortunes of war slightly against them. But it must be admitted that both classes of wethers and lambs are of remarkably high merit. Mr. William Cole, Wellow, Bath, exhibits two pens of wethers by a Hampshire ram, from Hampshire-Cotswold ewes, which are truly grand in character, and very solid in flesh. The first and fourth prizes have been awarded to them, and the first-prize pen soiled 8 cwt. 1 qr. 19 lb. Mr. H. V. Sheringham wins second prize with high class sheep of the same beautiful character he usually brings out, from Hampshire ewes by an Oxfordshire ram. Mr. William Robinson also has two good pens of the same cross, one of which gets reserve; but third prize goes to Lord Polwarth for useful Longwooled sheep of quite a different cross, that of a Border-Leicester ram on Cheviot and Border-Leicester ewes. Messrs. A Clarkson and Sons, Gormiston, Biggar, N B, show two pens of remarkably useful character, which are by Shropshire rams from Leicester and Cheviot ewes; while Mr. W. Tasker brings from Perthshire, and Mr. John Gilmour from Fife, two pens which are from Blackfaced Mountain ewes by Leicester rams. In the Lamb class, Mr. Cole is not so successful, although his lambs at eight and a half months old are, with one exception, the heaviest in the class. The exception is that of the first-prize pen, belonging to Mr. James Toop, Walberton, Arundel, of the Southdown-Hampshire cross, (1) which weigh 5 cwt. 1 qr. 22 lbs. His other pen, although not so heavy, displays also such beautiful character combined with substance that the judges have awarded them the second premium, giving the third to Mr. H. V. Sheringham, and the fourth to Mr. Thomas Rush, of Babraham, for admirable specimens of the

Oxfordshire-Hampshire cross. It says something for the high perfection to which cross-bred lambs are now brought, and the close running that takes place amongst our leading graziers, that every one of the eight pens that compete is over 5% = 186½ lbs. each. In the contest for the breed cup the verdict was in favour of Mr. Toop's lambs, Mr. Coles's wethers obtaining reserve.

DEATH OF THE QUEEN'S PRIZE HEIFER.—The great event with which the Smithfield Club Show concluded was the death of the Queen's shorthorn heifer, Princess Josephine 2nd, which occurred late on Thursday night, the terrible fog having affected her lungs. This animal, to which the championship of the show had been awarded, was seen to be ailing during the evening of that day, and was removed from her stalls to one of the buildings adjoining the hall, when her breathing became very bad, and she was killed during the night. The heifer had been sold to Mr. Jones, a butcher, of Llandudno for £160, or something like 3s. per lb. after having won no less than £375 in prizes at Birmingham and London.

The heaviest sheep in the show were two lots of Lincolns, averaging 345 lbs. each! The cross-breeds which showed the highest daily gain averaged 202 lbs. each; thus they weighed 3½ lbs. each less than the Hampshires, and were two months younger. Of course they were ¾ Hampshires-downs, and, much to the credit of the mixture, they showed an daily increase from birth of .79 lbs. = nearly 13 ounces a day or 5½ lbs. a week.

Take two sheep, of equal weight at slaughtering, the one a Lincoln and the other a Down; allow them both to weigh 10 stone, or 20 lbs. a quarter, the Lincoln favourite weight; again let both of them have made the same gain per day from birth as the records of this year's show give them, namely .75 lbs.: the Down sheep will have paid his proprietor a good deal more than the Lincoln, since he will sell in the London market for 3 cents a pound more = \$2.40.

I wonder what these 8½ stone Canadian sheep are that I see quoted at 4s. 2d. a stone while 8½ stone Downs are quoted at 6s. 4d! Forty shillings a head against fifty-three shillings and nine pence! A difference of 35% . Seriously, some one ought to undertake the improvement of our export sheep.

The Norman or Cotentin bovine race.

The Department of Agriculture has received from Count de Turenne, general consul for France in British North America, the following information which will be of very great interest to our readers.

If meat is the principal production of the breeding of the bovine race it must not be forgotten that in certain cases, the milk production also gives important profits.

The Norman race (of which we reproduce here a photo) unites perfectly these two essential qualities the abundant production of a very rich milk and that of an excellent meat. A good Norman milch cow gives daily on an average from 25 to 30 quarts of milk, which furnish at least 2 lbs. of that excellent butter the reputation of which is undisputed.

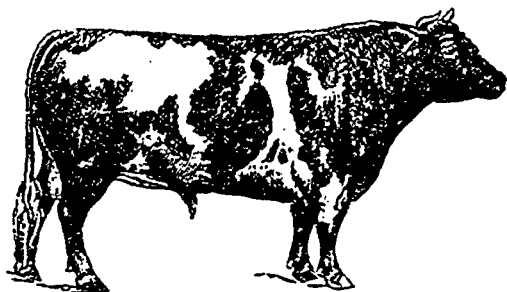
The necessity of a good choice of domestic races acquires considerable importance at our epoch of universal opposition in all agricultural production; we invite then the serious attention of breeders to the remarkable qualities of the Norman race.

Of a deep-dark coat, very often mixed with white spots, the Norman race offers a variety of colour which takes nothing away from the homogeneity, of that race very ancient and endowed with an excellent hard-book very rigorously established. The Norman cow has a large head, with eyes

(1) I remember, in 1852, putting three Southdown rams—from James Webb's flock—to 250 Hampshire-down ewes. The lambs were lovely, neatness itself, but they did not pay like the pure Hampshire-down. I had intended to keep on putting Hampshire-down rams to the young ewes, but, like Dogberry, I was "a rich fellow enough, but one who had losses," and had to give up. A. R. J. F.

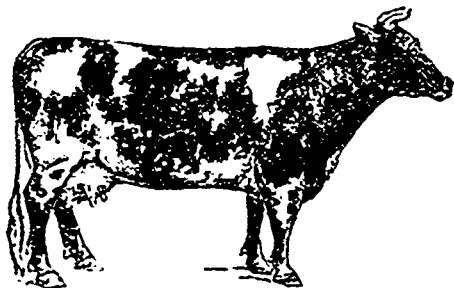
prominent, the muzzle is thick and turned up, the horns are fine and bent forward, the skin is supple, the breast wide and spacious, the back is straight and the traie behind of fine amplitude. The general conformation is then that of a good animal for butchers. An udder well made and of good dimension, covered with a fine and supple skin, extends even under the belly, and permits us to see, on its surface, big lactiferous veins, a certain sign of the copious function of the teats.

The Norman race holds in French breeding the best place. It spreads more and more in the regions of the North and East of France, but especially in the environs of Paris and the large towns, where its milk and butter qualities are highly appreciated.



The Belgian breeders who have had the opportunity of appreciating this race and of buying a certain number at the international Exhibitions of Antwerp (1886) and of Brussels (1888) are at present making a large importation. As fruitful a milking cow as the Dutch and Flemish, she is far superior to these last by the quality of the butter. The acclimation of this race, in Belgium has caused no disappointment, thanks to its rusticity, demanding only good food in the cow-house or good pasture.

Although the Norman race is not delicate, it must have abundant nourishment. It would be childish, in fact, to expect a considerable yielding in milk and meat from animals



fed parsimoniously. Experience has proved that the same quantity of fodder consumed by ten cows gives more milk and profit than if it were consumed by 15 or 25 cows. Every milking cow ought to be well fed; and the breeder who considers his interest will never forget this Swiss proverb: "A cow is like a cupboard, you cannot get out of it anything that you did not put into it."

The Norman cow reaches the weight of 1200 to 1800 lbs. and keeps always an aptitude suitable for fattening, which permits it to supply for slaughter, after an abundant lactation, a return of meat very remunerative. It is in the breeder's interest to possess cows which, after having furnished him with a great quantity of milk can be sold off without any heavy loss. This double destination has besides a far greater advantage for breeding; for the male calves which are not

kept as bulls furnish oxen that are quickly developed and soon get fat. The Norman oxen fattened at the age of 2½ years or 3 years reach the average weight of 1500 to 2000 lbs. It is not rare to find subjects weighing 2400 lbs at the age of 3 years. The meat is excellent, and so much appreciated on the market of La Villette (Paris) that it obtains currently a greater price by ¼d or ½d (½ to one cent) per lb than the special races for the shambles such as the Durhams the Limousins, the Livernais, or their derivatives.

When the Norman race is better known, it will obtain promptly that reputation which has perhaps been granted with too much infatuation to other races.

Let us add, in terminating, that the Norman Herd Book created in 1883, and of which the seat is at Caen (Calvados), counts at present a considerable number of inscribed animals, sires and dams (about 4,000), and that this useful institution puts under shelter from all foreign contact the purity of this excellent and fine Norman race which has been long proclaimed the first milking race in the world.

For every information about Norman breeding apply either to the Prefect of Calvados, President of the Commission of the Herd-Book, at Caen, France, or to M. Delahoguette, Secretary of the Commission!

(Not translated by me. A. R. J. F.)

Paper on Draining read by Wm. Ewing before the Dairymen's Assoc of Huntingdon, at Huntingdon, on February 17th 1891.

When I received an invitation from your worthy Secretary a few days ago to come to this meeting, and say something on the subject of draining, I at first thought that, owing to this being a very busy time with me, I could not give such an important subject the consideration it deserved—neither has it been possible for me to do so. Still, I thought it would not be "neighbor like" to refuse, and so I will, with your permission, make some remarks on the subject, may be not, though, of sufficient merit for such an important subject, as to lay before a meeting of such intelligently practical farmers as your association is composed of. If, however, what I say should be the means of interesting farmers in the matter, or of drawing out the views and opinions of those of you who have had practical experience in the drainage of land, or who are interested in the subject, I will be satisfied that I have done some good to the agricultural community, and I only wish that, I could by precept or example or any way else, prove the benefits to be derived from the drainage of land, in need of such an operation, so conclusively, as that all farmers having such land, would at once commence operations.

I request that you, Mr. Chairman, will ask any one here present that has practical experience of the results of under-draining, to let us have his views on the subject, as more benefit may be derived from a conversational discussion, than could result from the reading of an elaborate scientific paper on the subject, even were I capable of preparing such, and each of us can think out for himself whether he has one field, or a number of fields on his farm, in which it would pay him to bury money in drains.

I do not want to claim that draining is the one and only point that should occupy the thoughtful agriculturist's attention—I don't want him to become a crank on this subject—to the exclusion of other details of farming, but I do claim that sufficient attention is not paid to the Drainage question, and this can be easily seen—must be seen—by any one traveling through the country who keeps his eyes open. I claim therefore, that the operation of draining is an important one, and I hope will interest you all, anyway I shall have the benefit of

handling a subject that cannot be called a dry one, whatever may be said of my remarks.

In farming, as in all other undertakings, a wise man will always count the cost before commencing any operation; in other words, weigh the matter well, and try to find out whether or not the cost will over-run the profit. This point as regards draining deserves special attention in a country where land is plentiful, as well as comparatively cheap. Still, my contention is that most wet lands will make paying returns for the cost of draining—and here I will give you the gist of a conversation I had not long ago with a St. Laurent farmer, and a most practical man. He has laid down quite a large area of tile drains.—I don't remember the distance apart of the drains, but I think the cost was \$40.00 per arpent. He told me of a field he had that he never could get wrought in proper season. If he sowed grain, it generally got stunted and yellow and yielded poorly—if potatoes, the seed often rotted, or if the weather was favourable and a good start got, the tubers generally rotted in the fall. When in hay, this field never produced the crops got from his land that was not so wet. Well, he tile drained this field, and ever since it has been as good a field as he has on the farm. This \$40.00 at 6% cost \$2.40 per acre. Well, 6 bushels of oats, $\frac{1}{3}$ ton of hay, 4 or 5 bags of potatoes of an extra crop over the old average, paid the interest, whereas, in fact, his crops were about doubled.

This may be an exceptional case, but I am sure many of you can corroborate it by cases coming under your own notice, and I am also sure that many of us can point to fields cultivated for generations, that this \$2.40 of interest per acre spent on draining, would nearly have doubled their producing power every year. I mention this actual case merely to show the possibilities of draining and how, that if only a 10% profit would result, it would be correct merchandizing to borrow money to make drains. Any one whose land requires draining, and who has money invested or lying in Bank, at 3% would find his best Bank, and his most profitable investment to be in draining his own land.

In proportion as land increases in value, and as the struggle to make farming pay becomes more intense, so must advanced methods, and continually advancing methods, be adopted by the tiller of the soil, and he must take advantage of any system that will increase the growth of crops, at the least expenditure of money, and then he must acquire such machinery as will minimize the cost of securing these crops.

The term Draining as applied to agriculture, merely means the taking away of superfluous water—water that is not a benefit but an injury to the soil. Pure clays absorb and retain water the longest, gravelly or shaly limestone soils the least. After heavy rains, whenever the earth is thoroughly saturated, the water should move off from below, therefore a good depth of soil through which the water percolates—but never becomes stagnant—is exactly the soil in which plants suffer least from drought and drowning, and so clay soils generally receive the most benefit from under-draining. We often hear of a soil being warm and early—well the great aim of every farmer—should be to have all his land in that condition, and so the effort should be to change the character of such soils as are cold and late, by judicious draining. I can't go fully into scientific reasons or explanations, but would simply mention that an excess of water in the soil keeps it cold, as the water is also cold and is continually carrying off the natural heat, both by radiation and evaporation. And neither does it carry heat downwards, because the water nearest the surface, is to a certain extent, heated by the sun, and is consequently lighter than the colder water below, and thus remains floating on top, and so naturally gives back its heat to the atmosphere and does no good to the soil. On the other hand when rain-water can sink freely into the soil to a

depth of 2 or 3 feet and then finds its way into drains, it carries down with it the natural heat acquired from the atmosphere, and from the sun-heated surface of the land, warming the sub-soil, and as it were, opening the pores of the soil to the admission of air and the drawing up of necessary moisture afterwards, and thus imparting vigour and growth to the roots of the plants growing on the surface. It has also been proved by a series of experiments that drained land, seven inches below the surface, has on an average 10 degrees more heat than the same land at the same distance below the surface before being drained, that is in its natural state—this would make 10 days difference in ripening a cereal crop. Another point is that wet land, though producing quantity does not produce quality, even of grass. As a rule only the coarser and sub-aquatic varieties of grasses grow naturally on wet land, and though these grasses fill up, they don't fatten, and the quality of milk is very different from that obtained from cows feeding on the tender succulent grasses which naturally grow on well drained or porous land.

There is much useful draining done by making ditches and keeping them clean (1); water-furrowing the land, so that surface water flows into those ditches. It is a good sign of a farmer to note the work he bestows on these operations, but it is not thorough, and it is a yearly expense besides, and generally it would be better to dig drains and lay pipes once for all—this would be doing the job thoroughly.

The larger question of draining waste bogs or swamps need not be gone into. I wish only to speak of the proper drainage of our cultivated land. There is land, of course, that wants no drainage—such land as is so porous that the rain that falls on it sinks down as far as required to develop the roots of cultivated crops, and gradually oozes away through a naturally porous subsoil. We have all noticed, too, that land that in wet weather gets the soonest saturated and has water lying in hollows and furrows, or running off when there is a fall, are exactly those that won't stand heat—soon getting parched and dry, and cracks appearing—such land wants draining, badly.

In cultivating land for such crops as carrots, mangels, turnips or potatoes, the soil must be thoroughly tilled to respond profitably, but with wet land this cannot always be accomplished in the proper season, and we all know working land when it is wet is far worse than useless. If it be a rainy spring, the work is often delayed, but with dry or drained land, generally, a couple of days delay is enough to enable you to go on with your work again; after rain, with wet land, you may be unable to work on it for a week, and even then the labour is increased, the manure applied to such land is to a certain extent wasted, and later cultivation does actual harm, causing such wet land to hold even more water than it would do if left alone. Looking at the matter all round—taking into account the extra cost of labour, and the risk in cultivating wet land, I think in most cases it would be the wisest course to lay such lands down permanently in grass.

Though we state that clay land, as a rule, shows most improvement by drainage, we must not jump at the conclusion that it will be as friable and as easily wrought as naturally porous soil. Such is not the case, and clay soils, even if drained, can't be worked immediately after rain—if they are, we pine the result would be—clods.

It occasionally happens that some agricultural theories are not very quickly admitted by agriculturists, but the beneficial effects of thorough draining are at once strikingly apparent. The removing of stagnant water from 3 or 4 feet of the depth of land, and thus allowing a free passage for water and air from the surface to the level of the bottom of the drains, speedily improves the soil and subsoil to that depth, and renders

(1) True; but ditches get their bottoms puddled, and don't drain like drains.
A. R. J. F.

it more friable, and the operations of ploughing, harrowing, and tilling generally, are easier and better done; and, what is a great point, can be commenced much earlier than when land is undrained and wet.

Not only is the cultivation of the land rendered easier by drainage, but the increase in crops is so apparent, that the most experienced and the best practical farmers are now perfectly agreed that good drainage is an indispensable preliminary to good cultivation.

I mentioned in a former part of this paper, that we all have seen plenty of land in our province badly in want of under-draining. As a sample, take that stretch of land lying to the south and south, east of Montreal, and on to Richmond, and notice the waste that has gone on for generations. It has mostly to be plowed in 12 foot ridges, well thrown up, so as to admit of surface drainage. The grain is generally good in the centres of the ridges, but there is about 5 feet in every twelve, that produces very nearly nothing. If by under-draining, such land could be ploughed in 24 or 30 feet ridges, would it not pay to tile drain it? I think it would. It is not wise treatment for plant life to have the roots in cold water, and the plant itself in torrid heat, and that is about what happens in our hot summers on such land as I refer to. (1)

And now a few words about partial drainage. We all know how frequently springs are met with along the base of steepish hills, and the overflow from these if left to itself, soaks through the land below their level, until lost in some creek or ditch.

Generally, a drain can be cut crossways that will intercept this soakage and conduct the surplus water where it will do no harm. Or take a field having a porous subsoil, and on a slope, with below it a level field, but with a different subsoil as often happens, which lower field was rendered useless for arable purposes by this water coming from a higher level. One drain cut crossways, with a proper fall and deep enough to intercept all the water, might be so effectual as to render the lower field perfectly dry and capable of producing fall crops. The same way with springs—which though not overflowing the surface—the water from which is often to be seen coming near enough the surface to spoil a whole field for economical working, by making wet spouty spots through it. Try to locate the main spring, cut a drain to it in the most direct way to get a good fall into the side ditch, and for little cost, likely enough a great good can be done. Doubtless too you have often noticed wet hollows or “dishes” in a field, which are a source of annoyance and expense every time you have it to till. Most of the field may be in good shape for sowing, but if you go through with your work, these spots work badly and consequently produce poorly. Such hollows can sometimes be drained by digging a regular reservoir in them of the width and depth you think necessary for the purpose (distributing the earth round) then dump it pretty full of stones, cover over with earth again, and make one main drain from this reservoir to a ditch, or wherever there is a proper fall to conduct the water, and you can gradually fill up the hollow to the level of the surrounding land with ditch cleanings etc.

The under-draining of land though only becoming generally practised and reduced to a system based on scientific principles within the last 50 or 60 years—had been advocated, and a book written on the subject by Captain Blithe, an Englishman, as far back as 1652. The ancient Romans too, in the days when farming was considered an honorable occupation by their most distinguished and most learned men, kept their arable lands in good condition as regards moisture by a system of surface drainage—and the majority of farmers of to-day have not got much further ahead than this! We all know the point to which agriculture and those who lived by it had sunk

(1) Very good, indeed.

A. R. J. F.

during the middle ages, but towards the end of last century and beginning of this, the tillers of the soil, in all lands, have been gradually becoming more observant of facts in relation to their occupation that tended to improve the land they cultivated and augment the crops obtainable therefrom, and this improvement keeps gradually, but surely going on, and the farmer of to-day, who is the most successful, does not rely on or practise the art of agriculture altogether on the same line as his grandfather did, but holding on to such methods of older times as are good, keeps abreast of the present, and assimilates all the newer systems which he finds practical and profitable.

Now a few words about modern and thorough under-draining. About the beginning of this century, (I refer to Britain) most of the draining that was done was only partial—the cutting off springs or draining wet hollows such as I have referred to previously. However, about the year 1823, the late James Smith of Deanston, near Stirling in Scotland, commenced his draining crusade.

Mr. Smith, instead of recommending the plan of drying large areas of land by heading off springs, that may have been the principal cause of the mischief, insisted that every field that required to be drained, should have a complete system of parallel underground drains, running the way that the land sloped, and that these drains should be so near each other as to be able to carry off quickly all the rain falling at any time upon the surface. The distance between drains of course being regulated by the porousness or retentiveness of the soil drained; and he gave 10 feet as the minimum and 40 feet as the maximum of these distances.

Mr. Smith thought that a depth of 2½ feet was sufficient for parallel drains but latterly 3 to 4 feet has come to be considered better. I think in this country a drain should be 3 feet deep anyway, there are, however, differences of opinion about this, because some assert that with a shallow drain, the frost getting out of the ground down to the level of the drain, enables it to act quicker.

Before the invention of drain tiles, broken stones were used and filled into the drain to the depth of 12 inches.

The main receiving drain should be carried along the lowest part of the ground, generally at right angles (1) to the parallel drains, and if there are hollows in the land through which the parallel drains run—submains should be dug in those. At first these main drains were formed with flat stones and care was always taken to have them large enough to carry off ALL the water that the parallel drains could put into them. The cost of breaking stones was very great, and when the Marquis of Tweeddale invented a Tile Making Machine, tiles soon supplanted broken stones, were equally efficacious, and cost far less money. In the system of thorough under-draining a properly out fall must be secured at whatever cost, and a proper fall secured for both the parallel and main drains.

In flat land, where the fall is obtained by commencing shallow and gradually working deeper, the lines can be run on the direction that is most convenient,—but where there are heights and hollows, a field may require to have several sets of drains, at different angles, to suit the different slopes of the land, and it is when such a system is necessary that the greatest care has to be exercised to make draining a success. Again, supposing part of a field is flat and then gradually ascends, according to the Deanston system, a receiving drain should be cut at the bottom of the slope and the flat ground should receive an independent set of drains. It often happens, especially with the mains, that they necessarily run too close to trees, and if no notice be taken of this, these main

(1) But with a slight curve running with the fall where the main drain enters the main.

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drains will not take long to get choked by the roots. A good plan to prevent such happening is to mix saw-dust and coal tar together to the consistency of mortar, put a layer of this in the bottom of the drain, then lay the pipes and coat them carefully over to the thickness of an inch or more. The months of maize (or receiving drains) should at the outlets be built of stone, and if iron gratings (1) are put on so much the better.

There are a few points I would like specially to emphasize. Draining is an expensive business and it therefore should be done carefully and well, so that it will be a permanent benefit. If it be noticed that there is in a field to be drained a layer of gravel, sand or other porous material, charged with water—should it be 4 or 5 feet from the surface to make your drains thoroughly effectual, you must reach it, and if the soil be clayey or the subsoil retentive, 24 feet is far enough apart to put either a 3 or 4 feet drain. Attend carefully to the levelling of the bottom of the drains which, to be right, should only be cut out the width of the pipe, and to the correct laying of the pipes—unless all these operations be carefully executed, under draining is pretty sure to be a waste of money.

I won't say anything about the cost of parallel under-draining, leaving that to some one who has more practical experience in the matter than I have as regards Canada, but in Scotland, drain pipes used to cost from 16 to 18s. per 1000, and draining and laying pipes (3 feet drains) 2½ feet apart, £6. 10s and 30 feet apart £5. 5s per imperial acre, and there is no proper reason why the cost should be much more here. The Government used to give a bonus to a firm in Montreal to induce them to make drain pipes, and at that time, as I understand, they could be bought at a reasonable price; to-day the price is almost prohibitive and why? Principally because the demand is so light that it is not worth while manufacturing the article. (2) If farmers would take my advice, and go in for draining, this reason would soon cease to exist. If the demand were large, competition between manufacturers would keep the price low enough.

Before closing, there is something I want to say in reference to a plan which I think should be undertaken, by either the Local or Dominion Governments. There is an immense amount of money spent by both Governments nominally for the benefit of the farmer, and of course indirectly for the benefit of all the inhabitants of the country. I said nominally, because it is not all wisely spent, a great deal of it being spent where and how it will do most good to the political party that may happen to be doing the spending. In saying this, I reflect in no way on the experimental farms founded by the Governments of either the Dominion or the provinces, which are properly conducted, and with such men at the head of them, as Mr. Saunders, or Mr. Robertson, or Mr. Shaw, and many other names I could mention. There is no Government Agency that I know of, that is capable of doing, or is doing, such a great good for the farmer. There is money foolishly spent, however, and we don't need to go out of the Province of Quebec to notice that much of it is thrown away, or if that is too strong, I would say that, as regards doing any good to the Agriculture of the province, it is simply wasted. Now, I think that if Government would undertake a drainage scheme, and stop many of the other drains, that flow from the Department of Agriculture of the Province of Quebec, that it would show its wisdom, and do more good, both for the present and the future, to agriculture and agriculturists, than results from the money that is at present debited to agriculture.

It is a matter of history, what a drainage scheme did for

(1) To prevent the entrance of rats or mice, that would soon stop up the drain.

(2) Just as it is the case with fertilisers.

A. R. J. F.

A. R. J. F.

Britain, but specially for Scotland, because of the first four million pounds Government money granted—Scotland took the half of the amount and with the result, that Scotland to-day is, I think abreast, if not ahead agriculturally, of either England or Ireland, taking into account the comparative general quality of the land of the three kingdoms.

The British Government made a yearly charge of 6½% which in 22 years wiped out the original debt. Later, however, as money got cheaper, landlords were glad to lend money to their tenants for drainage purposes at 4 to 5% and even that was higher than it should have been, considering the rate of interest on money invested in Consols.

To come to a practical proposition, and one which I think should be brought under the notice of the powers that be, by farmers representatives:

I don't know what is the amount that is spent in this province yearly for the advancement of Agriculture, but it must be a pretty steep amount—but whatever it is, a half or a fourth of it could be very advantageously diverted from the present channels through which it flows, and spent on Government Drainage. I mean that Government should spend this proportion in taking out leading mains or levels; deepening creeks or small rivers that happen to be natural out-falls for some sections of undrained land; this being done, private proprietors could in many cases drain their land which they otherwise can not. This would put no extra burden on the tax-payers, nor increase the expenditure of the Government, which in our Province is very important. Then, I come to the main point that I want to bring before you.

The Government can procure money by the sale of say 25 year bonds. Let them borrow such a sum; specially for drainage, as may be found necessary, at 3% which I suppose they can do. This money to be borrowed by farmers from the Government for drainage purposes, and for that alone, and the Government of course laying down rules that have to be rigidly enforced as to the money borrowed by the farmer being employed for the purpose of draining, and let it be a debt against the land, till paid.

I have calculated the length of time it would take by the borrowers paying 4% per annum, till the Government would be recouped for their original loan, and I find it would take 41 years and a fraction.

Now remember this is at 4%. If however, 5% were paid by the borrower yearly, his indebtedness to the Government would cease in 26 years, and if the interest were paid every half year, instead of yearly, the Government would have all their money back between two and three years sooner. I had not time to make this calculation exact—but am sure it would be somewhere between two and three years. In this way without increasing the permanent debt of the province, all the land that requires draining could be properly drained by the proprietors thereof, if they chose to, by money borrowed from the Government, and at a cost that (taking into account the facts that payment of interest terminated in say 25 years when paying 5%) surely would make judicious draining a most profitable operation. A farmer borrowing money at 5% to live on, may not be a profitable speculation, but that he could stand it to drain land, I am certain. The common good would not be burdened one cent, except for administration, and the farmer directly, and every one else indirectly, would certainly be benefited. This scheme must I admit, I have put in a very crude way before you, but to me it is plain enough that we cannot be poor in this age of steamships, and other transportation facilities, if we have good crops, and underdraining is one of, if not the main operation, required to attain the end. In closing, I submit that more good can be done by Government adopting such a scheme as I outline, than any scheme of reciprocity we shall ever obtain from the United States, or

by all the gold and silver medals or other decorations that can be given, or money wasted on Fire-Works or other nonsense. Though not myself actively engaged in Agriculture, I think no man can take more interest in farmers and their work, or pleasure in their successes, and so I conclude by wishing "Peace to the Husbandman and a' his tribe, whose care tells a' oor wants frac year tae year. Lang may his sock and couter turn the gleybe, and bauks o' corn bend doon wi' laded ear."

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Mrs. Jno. Early, Hamilton, Ont.

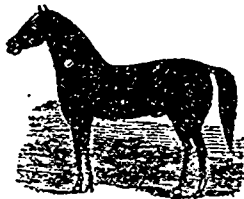
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