

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/
Couverture de couleur

Covers damaged/
Couverture endommagée

Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

Cover title missing/
Le titre de couverture manque

Coloured maps/
Cartes géographiques en couleur

Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

Bound with other material/
Relié avec d'autres documents

Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Additional comments:/
Commentaires supplémentaires:

Coloured pages/
Pages de couleur

Pages damaged/
Pages endommagées

Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

Pages detached/
Pages détachées

Showthrough/
Transparence

Quality of print varies/
Qualité inégale de l'impression

Continuous pagination/
Pagination continue

Includes index(es)/
Comprend un (des) index

Title on header taken from:/
Le titre de l'en-tête provient:

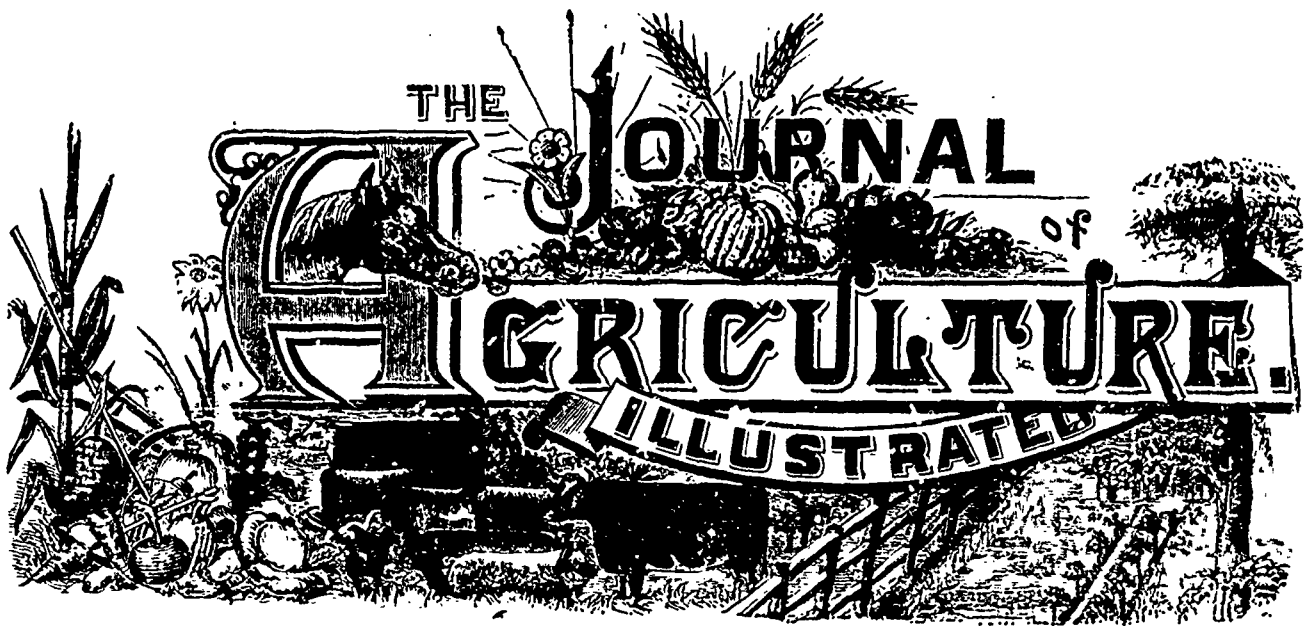
Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
								✓			



Published for the Department of Agriculture for the Province of Quebec, (official part) by
EUSEBE SENECAI & FILS, 20, St. Vincent St. Montreal.

Vol. XII. No. II.

MONTREAL, NOVEMBER 1890.

\$1.00 per annum, in advance.

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. R. Jenner Fust, Box 109, Lachine, Que.—or to Ed. A. Barnard, Director of the *Journals of Agriculture, &c.*, Quebec.

OFFICIAL PART.

Table of Contents.

A few Hints on Vegetable-growing.....	161
De Omnibus Rebus.....	162
Creameries.....	166
Nutrition of plants.....	166
Seasonable note.....	168
The Dairy.....	170
Types of Sheep.....	171
The Apiary.....	171
Crimson clover once more.....	172
The Poultry-yard.....	173
Growing Sainfoin here and abroad.....	173
Swamp land and muck.....	174
Food rations.....	174
Calf-rearing.....	175

A few Hints on Vegetable-growing.

Tomatoes.—Another cool, wet summer, and consequently, wherever I turn, I see a quantity of green tomatoes clinging to the plants and no signs of really ripe ones. Hundreds of bushels will go to the pigs this season, as they did last year, and all for want of a little consideration. If you want a lot of leaves and wandering stalks, covering an immense extent of land, and only ripening their fruit, if ever, when the sun has lost its flavour-giving power, you can set your tomatoes, as I saw recommended in the Americans papers last week, at six feet between the rows and four feet in the row.—which will give about 1,800 plants to the imperial acre: there will be plenty of herbage, but not many bushels for the canners, who need sound well ripened fruit. Then, try the plan I have so often recommended in this Journal: plant two feet between the rows, and eighteen inches in the rows=12000 to

the acre—stake them, and pinch back the suckers at the axils as soon as they begin to shoot, and see every fruit ripen from the second week in July to the first week in September. Like tobacco, the plants will require suckering at least once a week, but any child can do it, and it is soon got over. Stakes, 3½ feet long, don't cost much here, and any strong rags do to tie with. Bad as the season has been for ripening fruits of all kinds, I have had to buy green tomatoes to make my usual autumn-pickles, my own having all ripened and, as we do not care much for them ourselves, I have the pleasure of giving away to my neighbours what was certainly a rarity this year, namely, thoroughly ripe early tomatoes.

The market-gardeners in the neighbourhood of large towns, with their glass-houses, cold frames, &c., manage to ripen off a crop of tomatoes in pretty fair time, but even they would gain a good deal if they would adopt more generally the single stem plan. Dr Girdwood, on his island, and the Messrs. Dawes, at Lachine, always practise it, and believe in it thoroughly; at Sorel, no other cultivation of the plant is pursued, and there it is not an uncommon thing to see ripe tomatoes by the 10th July, and selling for 50 cents a dozen! But we have not all got gardens on the Sorel sand!

And as to the kinds of tomatoes to grow, what shall I say? *Acme* is good and early; *Favourite*, *Perfection*, *Smooth-red*, are all useful kinds; *Mikado*, or *Turner's hybrid*, I don't care for. If your soil is poor, try the *Trophy*, but at all events don't attempt the growth of the modern sorts unless you can be sure of starting them into quick action in an advanced state and in a sunny exposure at an early date in summer. A neighbour of mine sent for his plants to Toronto—very fine well grown plants they were, too, and travelled superbly—but they were all too large-fruited for his purpose, and the consequence was that, in spite of his growing them

on proper principles, September was well advanced before the fruit changed colour. To have *large* and *early-ripe* tomatoes, the land must be rich.

Hotbeds for tomatoes should be ready to sow by the 10th March. If you like to sow aubergines—egg-plants—in the same frame, you may, but I would rather let them have a home to themselves, as the tomatoes may sometimes require a slight check, which would be the death of aubergines. Sow the seed half an inch deep, in rows four inches apart and press the soil down firmly. As soon as the plants can be handled, pull up the whole lot, and prick them in again 3 inches apart every way. Repeat this as often as you care to take the pains: frequent transplanting makes hardy, stocky plants. Don't water too much.

By the 20th April the plants should be ready for the cold-frame; this should be opened every day, if there is no wind, as soon as the chill of the morning is off, but kept well covered up all night: were not my best tomatoes severely touched by the frost on the 3rd May this year? On or about May 16th, if your place is well sheltered from the cold winds, the final transplantation may take place, but the date must of course be left to your judgment, the custom of your locality being worth considering.

To my mind, it is a matter of indifference whether the manure for this crop be applied in the previous autumn or just before planting, provided always, in the latter case, it be in a fairly rotted state. The bastard-trenching spoken of before will help this crop amazingly through the dry weather of the latter summer. As the plants, whether in pots or in the plain earth of the cold-frame, will, after so many movings, be a mass of roots and soil, they will need a larger hole to fit them: this may be made with a trowel, taking care to loosen the soil all round each hole before planting and to press the plants firmly in afterwards. I need hardly say that, in both cases, they should be copiously watered an hour or so before setting out; they will need no further water. Keep the hoe going, and fork between the rows as often as possible.

I see, by my diary, my tomatoes this year were planted 14 inches apart in the rows on May 15th, and were suckered for the first time June 2nd, and the first ripe fruit was gathered the last week of July, not nearly so fine in size or quality as in ordinary years.

You can grow tomatoes anywhere: in a gravel walk, if you take about a foot square out some ten inches deep, and refill the hole with good, rich earth.

This year, I allowed some of mine to form six bunches of fruit before topping; but, generally speaking, four bunches are safer than five, unless the exposure is due south and the plot perfectly sheltered from north and east. My home-garden is so completely protected that as I write—October 4th—tomatoes, lettuces, vegetable-marrows, and scarlet-runners, are as green as in August! Geraniums, pansies, and phlox, are still untouched. This must, in a great measure be due to the effect of the great body of warm water—Lake St. Louis—that flows past the place, as I hear that all tender plants in the neighbourhood, lying a little inland, were cut off by the frost of September 20th.

Vegetable-marrows.—I have been revelling in this delicious vegetable all the latter summer. They are easy enough to grow, but if people will allow them to exceed four inches in length before gathering them, they are no better than any other kind of squash. Start them in small pots, in a moderate hot-bed, harden off, and set them out about the 20th May, providing some sort of protection for them against frost, and, particularly, against wind. I prepare the land for them in this way: make a trench 18 inches deep and as much in width, which fill with fresh, hot horse-manure—

rather strawy than otherwise—; return the earth, mixing it with thoroughly rotted dung, and set the plants, four feet apart, on the ridge. In a wet season, like 1890, they will run like anything, and they must be allowed to run, as I never saw any good in checking them, more than stopping once when the plants have about 5 or 6 leaves: this is for the first crop. For later use, I got some pots of plants ready to set out about the 25th June, as soon as the first few young potatoes are dug, and put them in on the level ground, digging in plenty of dung around them as the ground is cleared. These late ones keep us supplied all September.

To cook vegetable-marrows: as I said before, they should be gathered when not more than 4 inches long; dressed the same day they are plucked, for if allowed to get the least limp, they are ruined; boiled rapidly in salted water, but not too much done: the skin—the best part—should be rather crisp; and they should be served on *dry-toast* with melted-butter—*sauce blanche* won't do—and black pepper. I prefer them with salad oil; *Lucca* is the right sort, though Italians do like their oil a little rancid!

After the hotbeds have done their first work I find a use for them in two ways: either I sow mushroom-spawn on them, or gherkins for pickles. For the former, they must be kept dark and damp, but not sippy.

DE OMNIBUS REBUS.

Butter.—I see by the English papers that the best Normandy butter is quoted on the London market at 21 cents a pound, and best Corks at 18 cents. I am paying 30 cents a pound for butter that is only fit for cooking!

Wheat.—The best white-wheat has been fetching as high as 44s a quarter in some of the English markets, but the price has fallen off 4s. since, a dollar and a quarter a bushel is about its value now, and as the same quality would sell for \$1.10 in Montreal, I don't think we shall export much this season profitably. Impossible to find out the real truth about the Manitoba crop. As for the States, they are past praying for: wheat won't average more than ten bushels an acre—spring and winter together—and only 60 lbs. to the bushel! Corn 19 bushels an acre. Of oats the indications are for but 64 per cent. of a full crop, or a reduction, as compared with last year, of fully 250,000,000—and possibly 300,000,000—bushels by measure, and the grain is from 10 to 15 per cent. below the normal weight, and probably 25 per cent. below the normal feeding value. So decided is the inferiority in weight of new oats, that Chicago vessel-owners are now insisting on a premium of one-fourth of a cent per bushel over regular rates where they load with new oats. Considering the shrinkage in yield and chaffy character of the grain, it is evident that this year's oat crop has not half the nutritive value of that of 1889, and that of feeding grains we have produced but 1,875,000,000 bushels as against the 2,863,000,000 of last year—the difference amounting, in round numbers, to the enormous quantity of one thousand million bushels, with every probability that the recent frosts (severe enough to kill corn here in latitude 35° north) have reduced the corn to be harvested by another 100,000,000 bushels. *Ex.*

Potatoes.—This crop is very poor in yield about here. On the Cross farm, where nothing could exceed the pains taken with its cultivation, there cannot have been more than at the outside 120 bushels an acre, and that in spite of extraordinary dunging, three horse-hoings, and two hand-hoings, in

addition to harrowing with the drill-harrows till the land was like meal. I fancy the heavy rains of May and early June jammed the land down too hard for the roots to travel and the tubers to swell.

Mr. Andrew Dawes told me last week that he had, he thought, grown the same sort too long, and felt inclined to relinquish the Beauty of Hebron and return to the Early-rose. I don't want a better potato than the latter when it is grown on real potato-land. The root-crop on this farm is prodigious! The only fault I can find with it is that the rows are unnecessarily wide apart; but the crop is healthy, the roots large and sound; and the tops look as if they meant growing up to the last minute of their life in the ground. As for the swede-tops they exceed all belief! How I should have rejoiced over them in England 40 years ago! Why? because if a covey of partridges once got into them they would lie till the pointers trod upon them! But, I fear, such luxuriant tops denote inferior quality of bulb, and whether the enormous growth of leaves be due to too much rain and a too copious dressing of dung, or, as Mr. Tuck seems to think, to inferior seed, I cannot say; for myself, I would rather use half a dressing of dung and a couple of cwt. of superphosphate than the monstrous coat of dung these swedes received. The remaining dung would be welcome to the pastures on the north side of the farm, across the C. P. R., which are poor enough, the farm having only been three years in the Messrs. Dawes' hands. (1)

Cows in England.—Good, roomy cows in England are worth from \$100 to \$130 apiece. These are what we call "Grade shorthorns." There are plenty of them in the Townships and in Ontario. Would it not be as well to try and send some of them to Britain? I think they would pay as good a profit as any of the lean beasts (graziers) I saw being shipped in July last. They should not be far advanced towards calving, and about 4 years would be the proper age. Good large bags, rich, yellowish skins, and good handlers, are the chief points to be looked after. They should leave by the earliest steamers of the season.

Price of rams.—What do you think a ram fetched last month in Sydney, Australia? Seven hundred guineas = \$3,500!!! Merino, of course.

Canadian potatoes will be wanted in the States, as they have there the worst crop ever known. The best of it is that, as the Monetary Times, of Toronto, truly remarks: "The customer there will have to pay the whole duty." Who was it that some years ago, in this very Journal, contended that the freight and duty came out of the grower's pocket?

Waste of time—The time lost in putting up bars where a gate should be hung, is considerable, but what is that compared with the time lost in going round a hole that a couple of loads of stones would fill up? This is brought to my mind by watching a neighbour carting his potatoes from the field to the barn. The road runs through a swampy place, and is quite sound with the exception of a spot about ten feet long; close by the hole in question, is a pile of stones, gathered from the land, two loads of which would fill up the faulty place perfectly; and yet the carts, going and coming are forced to make a circuit of nearly 50 yards to avoid the difficulty. Allowing 30 loads of potatoes to be drawn each day, the extra distance travelled will amount to 3,000 yards, or

(1) Mr. A. Dawes tells me the loss of potatoes is about $\frac{1}{3}$. Many of the swedes weighed from 14 lbs. to 16 lbs.; the mangels—yellow globe—15 lbs. and 17 lbs.

A. R. J. F.

nearly a mile and three-quarters! I need hardly say that my neighbour—a tenant-farmer—is not a Scotchman.

Sugar-beets.—I had a look last week at two lots of sugar-beets, grown in this district for the Farnham factory. The ground was so hard that I could find out nothing about the size of the roots, as they certainly fulfilled one important point desirable in the culture of the crop: they were complete, sunk in the land. The leaves were abundant, but the growth seemed arrested for the season, and this on the 24th September: rather early, is it not? Both the pieces were sown on drills, two feet apart, and singled to about 8 inches in the rows. I hope to hear what weight per acre the crop yield, but, as a rule, I find it very difficult to arrive at any certain information on such subjects.

Silage-cutter.—Well, at last we have here a perfect piece of machinery. Anything more satisfactory than the new silage-cutter imported by the Messrs. Dawes from the States I never saw. The maize is very stout, ears nearly hard, and the stalks average about 9 feet high, and yet the cutter swallows them up at the rate of a ton in five minutes. The cutting is most regular and clean; two men, working their hardest, cannot supply the maize fast enough, and the engine—14 horse-power—could drive four of the cutters at once with ease. I never saw a finer piece of work than the engine: it works with a mere trifling consumption of coal, and is as steady as a fixture. The 14 acres of maize will be all in the silos by about October 10th, and if the frost keeps off, as there is every prospect of its doing, this will be by far the most successful silage-harvest the Messrs. Dawes have had yet. (1)

Galloways.—On page 169 will be seen a fine representation of Galloway cattle. Galloway, as most of my readers know, is a district on the S. W. coast of Scotland, (Wigtown and Kirkcudbright) celebrated for its hardy breed of ponies: all horses about 14 hands that are too light in build to be called cobs, are called galloways in the South of England. The name signifies "land of the stranger," and is related to Galway, Walloon, Wallachia, Pays de Galles (Wales), Walter, the walnut, i. e. foreign nut &c. The cattle, as hardy almost as the kyloes, make, when fatted on the rich English pastures, about as good beef as need be; in fact, it would be difficult to distinguish between the Galloway, the Kyloe, and the Polled-Angus, as far as quality of meat goes, though the shaggy coats of the first will always distinguish them in a mixed herd from the smooth-coated Angus.

Some forty years ago, there was a great tendency in the district whence these cattle come to embark in the dairy-business, for which the constantly weeping climate and the mild winters—though there is plenty of cutting wind—afford great facilities, and the native stock were in danger of being entirely superseded by the Ayrshires. But they were hard to beat, and thanks to the Duke of Buccleugh, the Carruthers, the Grahams, and others, the breed survived, and the bulls besides continuing the propagation of their own kind, are much sought after for crossing with Shorthorn and Ayrshire cows all along the border. A glance at the engraving will show that the Galloways carry most of their beef on the best points: very little neck-beef but splendid rounds, loins, and ribs. Mr. Giblett, the well known butcher of Bond Street, London, used to have a splendid show of Christmas beef every year, composed entirely of Kyloes and Galloways.

A very interesting experiment on the application of artificial manures to the tomato was, tried at the New-Jersey ex-

(2) The job was finished on the 14th; leaves from A. R. J. F.

periment station last year. In this state; more than 16,000 acres of the plant are grown for the canneries, and about 2,000 acres for supply of the general public. The experiments were made for the purpose of testing the effects of the use of nitrate of soda alone, and in combination with liberal amounts of phosphoric acid. Twelve plots were employed, each $\frac{1}{8}$ of an acre in superficies. Nitrate was applied:

First, alone, at the rate of 80 lbs. an acre—May 7th;

Second, at the same rate, but divided—half May 7th, half June 12th;

Third, at the rate of 160 lbs. an acre—May 7th;

Fourth, 80 lbs. May 7th, 80 lbs. June 12th;

Fifth, 80 lbs. nitrate, May 7th 160 lbs. muriate of potash and 320 lbs. bone-black superphosphate per acre, and the same dose of nitrate repeated on the same land on June 12th.

The conclusion derived from these experiments were:

1st. The use of the small dose of nitrate of soda in one application, and of the large dose in two applications increased the yield without delaying maturity.

2nd. The large dose at one time increased the yield but delayed maturity. This is in perfect accordance with the general effect of nitrate of soda as applied to both grain- and root-crops in England, as I can testify by experience.

Of course, the best and soundest crops of tomatoes were harvested from the plots on which all three manures were used.

Dr. Hoskins observes, in the Vermont Watchman, that:

The teaching of non-exercise and close confinement of milch cows we are convinced is all wrong, as it must lead to a gradual but sure undermining of the constitution of both the cow and her offspring.

The point is a difficult one to settle, seeing that in many cases the close confinement of milch-cows is almost a necessity. Can we not make a compromise, and give the cow plenty of exercise from May 1st till the hard weather begins in January, and then keep her warm for the remaining four months of the year?

Tomatoes again.—Mr. L. H. Bailey, of the New-York Experiment station, sums up the results of his experiments in tomato-growing as follows:

(1) Frequent transplanting of the young plant, and good tillage, are necessary to best results in tomato culture.

(2) Plants started under glass about ten weeks before transplanting into field gave fruits from a week to ten days earlier than those started two or three weeks later, while there was a much greater difference when the plants were started six weeks later. Productiveness was greatly increased by the early planting.

(3) Liberal and even heavy manuring, during the present season, gave great increase in yield over no fertilizing, although the common notion is quite to the contrary. Heavy manuring does not appear, therefore, to produce vine at the expense of fruit.

(4) The tests indicate that poor soil may tend to render fruits more angular.

(5) Varieties of tomatoes run out, and ten years may perhaps be considered the average life of a variety.

(6) The particular points at present in demand in tomatoes are these: regularity in shape, solidity, large size, productiveness of plant.

(7) The ideal tomato would probably conform closely to the following scale of points: vigor of plant, 5; earliness, 10; color of fruit, 5; solidity of fruit, 20; shape of fruit, 20; size, 10; flavor, 5; cooking qualities, 5; productiveness, 20.

(8) Solidity of fruit can not be accurately measured either by weight or keeping qualities.

(9) Cooking qualities appear to be largely individual rather than varietal characteristics."

I should say, referring to No. 7, that earliness ought to have 20 points instead of 10.

Loss suffered by manure.—Investigations were made at the New-York station on this important question in the summer of 1889, and, allowing for certain drawbacks, due to the difference between practical and theoretical values, useful information may be derived from the inquiry. Whether, in any case, fresh horse-dung would sell for \$2.45 a ton—making the cost of a dressing of 15 tons to the acre—\$36.75—is for farmers to decide: in my opinion it would never pay to give more than a dollar a ton, and even then it must be pretty close at hand. One great point comes out: When manure simply dries, no appreciable loss of valuable constituents takes place; but of this we had long possessed practical security, seeing that the top-dressing of meadows in summer never fails to exert most beneficial influence on the produce. Still it is always satisfactory to know that theory confirms our practice.

(1) The manure of one day (excrement, solid and liquid, 491 pounds, bedding 38.5 pounds, total 529.5 pounds) from nine horses was exposed for six months out of doors in an open wooden box, which was not water-tight, and was placed in a pile of manure, the object being to subject its contents to the same conditions that prevail when horse manure is thrown out in a loose pile from a stable door. At the end of this time the composition of the exposed manure, as compared with that of fresh manure, was as follows:

Description.	Water.	Nitrogen	Phosphoric acid.	Potash.	Total weight of manure
	<i>Per cent</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent</i>	<i>Pounds.</i>
Fresh horse manure.	70.79	.51	.21	.53	529.5
Horse manure after having been exposed six months.....	81.74	.46	.15	.31	372

The losses, therefore, were threefold; first, a considerable loss in the total weight; second, a gain in the percentage of water; and third, a loss in the percentage of valuable fertilizing elements.

The commercial value of the nitrogen, phosphoric acid, and potash in a ton of the fresh manure is estimated to be \$2.45; while the same ingredients in the manure which had been exposed six months would be worth \$1.42, showing a loss of \$1.03 per ton, or 42 per cent.

Grain-feeding of cows on pasture.—At the New-York station, to test the value of this proceeding, six cows were used in two lots, as equal as possible in all points. Lot 1 got nothing but the grass of the pasture; Lot 2 got in addition 2 lbs. bran and 2 lbs. cotton-seed meal per head per day. The result was not satisfactory; there was a steady and constant diminishing of the flow of milk of both lots, but the lot that received extra food fell away in milk-yield much more rapidly than the lot receiving only what the pasture yielded, though there was a constant and considerable increase in the butter-fat of the former. "Still, no return in butter and milk was received from the extra food given." This seems contrary to experience, and would lead one to suppose that the management of the investigation must have been faulty, or that the weather had been such as to have vitiated the experiment.

One observation is worthy of attention: "The manurial value of the grain, at present price of fertilisers and fodder,

would go far towards balancing its cost." I do not think any farmer would be likely to expend money in the purchase of extra food for his stock, if all the return for his outlay were to be derived from the manurial constituents deposited by them after its consumption.

Potatoes.—Rhode-Island station experimented on this crop in 1889. Notable result was as follows: The average yield of the entire crop was 54½ bushels an acre! Volumens could not say more. I conclude from this that the soil of the Rhode Island experiment station is not suited to the growth of potatoes.

Oats.—At the same station, taking the two years 1888 and 1889 together, the yield of oats was related to the quantity of seed sown, in bushels, from most to least as follows: 3½, 4, 3, 2½, 2, 1½, and 1. We do not sow enough seed in this province.

The earlier the sowing, the larger the yield, and the greater the weight per bushel.

Seed potatoes.—Here, again, is an enormous contradiction of all pre-conceived ideas as to the size of potato-sets. I as you know, prefer two eyes to a set, but the following tables, from the Michigan station, shows that the best results were obtained there from half-tubers, weighing 1½ oz. or at the rate of 22 bushels an acre, which, curiously enough, is exactly the measured quantity we used always to prepare for an acre on my farm in Kent, Eng. The crops mentioned in the tables are good enough for any country, being, as we should reckon about 9 tons to the acre, decidedly a ten or a ton and a half more than the average crop in England. Hence, arises naturally the question: if the Michigan station can grow 9 tons an acre, how is it that the Rhode Island station can only get 1½ ton? I think, from what I gather from the perusal of some 1200 pages of Station-reports, that the Michigan Station is doing about the best practical work of the whole number.

Size of seed	Amount of seed.	Yield per acre.	Net yield in excess of seed.	Net gain from using halves.
		Bush	Bush	Bush.
Halves	20 bush., 19 lbs.....	317	297
Quarters	9 bush., 54 lbs.....	254	244	53
Eighths	5 bush., 44 lbs.....	221	215	82
Single eyes.....	4 bush., 10 lbs.....	178	174	132
Whole tubers.....	41 bush., 40 lbs.....	293	251	46

In another experiment, but in this case a single trial, *i. e.* with one variety, whole potatoes of different sizes were compared with halves and single eyes, as indicated in the following summary, in which the results are reckoned per acre:

	Quantity of seed.	Market able.	Small.
	Bush.	Bush.	Bush.
Whole tubers weighing 4½ ounces.....	60	370	62½
Whole tubers weighing 3½ ounces.....	44	361	31½
Half tubers weighing 1½ ounces.....	22	433	31
Whole tubers weighing 1½ ounces..	22	349½	45
Half tubers weighing ¾ ounce.....	11	305½	44
Single eye, cut deep.....	173½	21½

Onions.—At the Minnesota Station, in the wet season of 1888, and in the dry season of 1889, the results of tests with onions on clayey loam, which was harrowed but not ploughed—that is, I presume, not ploughed before sowing, but sown on the stale fall-furrow—were in favour of that treatment as opposed to land fresh ploughed, in the proportion of 600 to 431. No use trying to grow onions except on a firm bottom as well as a firm top.

Tennessee Station comes to the conclusion that the greatest profits are derived from potato culture when the *smallest sets* are planted!

ESTIMATED YIELD, COST OF SEED, VALUE OF CROP, AND BALANCE IN FAVOR OF CROP PER ACRE.

Weight of seed and distance planted apart.		Yield.		Cost of seed per acre at 75 cents per bushel.	Value of crop per acre at 40 cents per bushel.	Balance in favor of crop.
		Bushels	Tubers.			
Ounces.	Feet.					
12-12	3	146	90,980	\$48.00	\$58.40	\$10.40
10-13	2	220	135,075	60.75	88.00	17.25
8-10	2	195	118,102	49.50	78.00	28.50
6-8	2	168	115,273	39.00	67.20	28.20
4-6	2	158	108,908	27.75	63.20	35.45
3-4	2	146	104,665	19.50	58.40	38.90
2-3	2	141	81,323	13.50	56.40	42.90
1-2	2	128	67,184	8.25	51.20	42.95

The first two articles of the summary, taken from the bulletin of that station, runs: 1. The larger the potato planted, the larger the plant produced, and the more abundant the harvest in tubers. 2. Other things being equal, the fewer the number of eyes in a piece of seed-potato, or the smaller that piece of seed, the smaller the crop. Which is by no means in accordance with my experience in potato planting.

Milch-cows.—At the New-York State-fair, the following were the results of the competition of milch-cows. I am always glad to see the Guernseys win, as I believe them to be true farmers' cows.

Owner.	Breed.	Weight.	Milk.	Cream.	Butter unworked.	Butter finished.	Lbs. milk to L. lb. butter.
		lbs.	lbs. oz.	lbs. oz.	lbs. oz.	lbs. oz.	
Morton,	G.	3826	134 9	32 10	8 6	7 0	19.22
Robinson,	H.	5554	217 13	44 6	7 7	6 11	32.57
Stevens,	H.	4338	207 3	53 11	8 6	6 4	33.15
A. & McK.	J.	3314	101 6½	26 1	6 11	5 9	18.23

I wonder, by the bye, what success Mr. Abbott met with at the Ottawa exhibition. I see he at last made up his mind to show his fine herd. (1)

Two-rowed barley.—Professor Saunders, Director of the Ottawa Experiment farm, speaking of his experiments with 2-rowed barley, says: "The length of the growing season of this barley varied considerably for the two years in which the tests were made, but it is thought would probably average from 95 to 100 days in the vicinity of Ontario (Ottawa?). All the varieties of 2-rowed barley are later in ripening than the 6-rowed sorts, the difference varying from five or six to

(1) G. = Guernsey; H. = Holstein; J. = Jersey.

ten or twelve days. x x x—A very large quantity of barley is required every year for feed, and the fact that the 2-rowed sorts are on an average from a week to ten days later in ripening than the 6-rowed, might be an objection to their growth in some places. x x x It is not to be expected that malting barley of the right quality can be grown in every part of Canada." I presume Mr. Saunders means "of the right quality for the English market." The above Italics are mine.

Fine fall-weather here.—Thanks, as I said before, to the Lake St. Louis. This large body of water accumulates heat all the summer, which is radiated at night, and the presence of this stratum of air is shown by the absence of light frosts during late fall, as well as by the freshness of vegetation as far as the heated atmosphere extends; while more inland a more wintry aspect prevails. Another thing we have no dew, or hardly any; consequently no mildew.

Grain average in U. S.—For the last ten years, the average yield of wheat per acre has varied from 19.3 bushels in Colorado, to 4.7 bushels in Florida; the average of the whole Union having been only 12.3 bushels! The value of this crop per acre, during the years 1888, 1889, was \$9.97! Can it pay to grow wheat at this rate? It is clear that the foreign demand must have fallen off terribly.

Oats.—This crop varied in 1889 from 37.8 bushels in Washington Territory to 101 bushels in North-Carolina, the average of the Union being 27.0. Value per acre \$8.22.

Barley averaged 21 bushels an acre in 1889, throughout the Union, over about 3,000,000 acres, equal to about \$12.79 an acre. Six-sevenths of the crop is grown in seven States, California alone producing one-fourth of the whole. Up to the present, the importations of this grain have averaged 8,112, 876 bushels, costing \$6,041,495, but, this is at an end, as the McKinley tariff will put a stop to the introduction of Canadian barley, and it was from us that the brewers and distillers of the states got their supplies. Well, I suppose they know their own business best.

Potatoes.—The crop of this tuber for 1888—the crop for 1889 is not published yet—varied from 120 bushels an acre in Montana, to 60 bushels in Alabama, the average throughout the Union being 80 bushels—2 tons—and the value \$32.14, per acre. The New England States, of which I should have expected better things, did not yield 100 bushels an acre—2½ tons, New-York State only 80 bushels—2 tons! I suppose part of these blame for these trifling yields must be laid to the practice of planting in hills, the ground being not half occupied. Only compare these crops with the grand results obtained at the Michigan Station!

Farm animals in the U. S.—The decline in value of farm-stock in the States has been very serious. Horses have increased in number by more than 500,000, during the past year, but their aggregate value has decreased by \$3,500,000. Milch-cows are worth less by \$49,685, 918, than they were a twelvemonth ago, but sheep have increased in value by about \$10,000. The whole depreciation of farm-stock is given as \$88,284,000.

ARTHUR R. JENNER FUST.

CREAMERIES.

In my last article I spoke of those self-satisfied makers who fancy they know everything about butter-making, because for some time they have been churning milk and making butter, more or less good in quality. Nevertheless, a man cannot become a good maker unless he possess the necessary

qualifications, and be willing to devote himself to study and to the acquirement of knowledge in his business; for, in this industry, which appears, at first sight, so simple, every moment some unexpected problem to be solved arises. Most makers have passed through an insufficient apprenticeship, or have taught themselves the trade from empirical principles. Is it then surprising that they do not possess the qualifications that are indispensably requisite to manufacture a perfect article? Certainly not; and until the province of Quebec sees that the future of its dairy-industry depends upon the powers of its makers, and that it can only be furnished with good ones by the institution of dairy-schools, this business will be in danger of being injured, whereas, with proper management, it promises to become the most important industry of the country. It is high time to sound the alarm, seeing that its products are but too often inferior, and that if they appear in the foreign markets in their present condition, they will acquire a bad reputation, from which they will not recover even after they have been immensely improved.

The butters that are suited to the export trade at present, are often badly made, and, consequently, unfit for keeping: in this state, they only get a bad reputation and an inferior price.

Now, you must understand that the European markets are keeping an eye on us. They know we can play them a pretty trick, if our butters reach them in good order: and they will of course profit by our neglect to stamp our butters with a bad mark if they are not well got up.

We must have dairy-schools, where our young makers can go to learn how to conduct their operations, of which they unfortunately think they know enough already; then, only, will the future of the trade expand itself before us, the creameries will flourish, the dairy-industry will find a free exit for its goods instead of, as heretofore, being obliged to content itself with restricted sales, and the upshot will be that it will become the means of reviving the fortunes of the country. Still, for this there is one condition indispensable: when well taught makers are to be hired, the creamery-proprietors must understand that it is their duty to furnish them with buildings and implements worthy of such skilled workmen.

Until this is brought about, I feel justified in saying that every tub of butter exported will injure the reputation of Canadian butters on the foreign markets.

F. MACCARTHY.

(To be continued.)

The question is most important.

E. A. B.

NUTRITION OF PLANTS.

An interesting paper was read by Mr. MANLY MILES before the Agricultural Science Association on 'Some Biological Factors in the Nutrition of Plants.' The following is an abstract:

Reference is made to the earlier experiments relating to the sources of the nitrogen of plants, and particularly to the results obtained by Boussingault and at Rothamsted, which agree in showing that atmospheric nitrogen is not to any extent appreciated by the leaves of plants, and that the soil is the main or sole source of the nitrogen of vegetation.

In experiments at Rothamsted with wheat and barley, representing the cereals, it was found that notwithstanding the comparatively small amount of nitrogen in their composition, they were especially benefited by nitrogenous manures, while leguminous crops containing a larger amount of nitrogen were not benefited by such manures, and that they grew well under conditions of nitrogen supply that were not suffi-

cient for the cereals. Leguminous plants must therefore obtain nitrogen from some source, or under conditions that are not available for the cereals.

These facts are explained, in part at least, by recent experiments, which prove that the "tubercles" or "nodules" observed on the roots of leguminous plants, are caused by microbes, and that "the relation between the roots and the bacterial organisms is a true symbiotic one, each developing more vigorously at the expense of the other," and that free nitrogen is thus made available for the higher organism through the agency of the lower.

The experiments of Hellriegel leading to the discovery of these relations of mutual dependence, are noticed, and the experiments at Rothamsted in 1888 and 1889 with peas, vetches, lupins, red clover and lucern, which fully verify the results obtained by Hellriegel, are described in greater detail.

In these experiments the plants were grown in pots of clean white quartz sand, to which was added a small fraction of one per cent, of the ash of the plant under experiment, and this prepared sand was then sterilized by keeping it for several days at a temperature of 100° C. Distilled water was used in all cases to water the plants.

In each series, no other addition was made to one pot, while in two others the prepared sand was inoculated with a small quantity of the extract of a fertile soil. In a fourth pot plants were grown in a field or garden soil.

After about 4½ months, the yellow lupins in pot 1, in the prepared quartz sand alone, barely appeared above the rim of the pot, one plant being about 1½ and the other 2 inches high. In the inoculated quartz sand in pot 2, one plant was about 2 feet high, and the other 18 inches, both spreading beyond the width of the pot. One plant in pot 3, also in inoculated quartz sand, was more than 2 feet high, and the other little more than 8 inches.

The plants in pots 2 and 3 flowered and seeded, and they, in fact, made a better growth than the plants in pot 4 (in a soil from a field where lupins were growing), which were but 16 and 18 inches high, and less branching than those in pots 2 and 3.

There was little root development in pot 1, and no root-tubercles could be found. In pots 2 and 3 there was abundant root development, and numerous root-tubercles, exceeding in this respect the plants in pot 4.

Similar results were obtained with the peas and vetches, but the roots of the red clover and lucern were not examined, as the plants were kept for the second year's growth.

In all cases, luxuriant growth of the plants was coincident with the development of numerous root-tubercles, which were produced by the inoculation of a sterile quartz sand with microbes from a fertile soil.

The term *symbiosis*, as now used, is limited to the mutually beneficent relations of certain species living together in harmony, but the biological relations of mutual dependence presented by microbes and the plants growing in the soil, may extend to a series of organisms, each of which has its influence on the well being of the others.

The activities of microbes in soil metabolism are not limited to processes of putrefaction and nitrification. In the author's experiments with soil microbes they proved their ability to take their required supplies of lime and potash from solid fragments of gypsum and feldspar, and even from the glass tubes in which cultures were made, which were deeply etched by their action.

In the Rothamsted experiments vetches in a rich garden soil and lupins in a soil from a field where lupins were growing, did not grow as well as in sterile quartz sand containing a very small amount of the ash of the plants under experi-

ment, and inoculated with the microbes contained in a soil extract.

The biological factors concerned in preparing plant food appear to be quite as important as the chemical composition of soils in promoting plant growth. The cereals with the microbes that find favorable nutritive conditions in the vicinity of their roots undoubtedly have an influence on the soil that aids in fitting it for the growth of leguminous plants with their symbiotic microbes that appropriate free nitrogen, and thus add to the available stores of fertility.

The interdependent relations of soil microbes and plants of different habits of growth must be recognized as significant factors in vegetable nutrition, and a revision of the popular theories of soil exhaustion and manures is needed from the standpoint. The applications of science to agriculture will be best promoted by investigation relating to the life history of those organisms and their immediate and remote relations to the roots of plants of different species, and to processes of soil metabolism under different conditions.

In the light of recent experiments, Dr. M. T. Masters' prediction that farmers in the future will sow the germs of micro-organisms to increase the productiveness of their soils, does not appear to be a visionary one, and it is possible that the breeding of beneficial microbes may prove to be of as great interest to the farmer as the breeding of yeast now is in the manufacture of beer.

We must not, however, be misled by the plausible inferences that may be made from the evidence presented in regard to this recently discovered source of the nitrogen supply of leguminous plants under special conditions. It is not safe to assume that the nitrogen removed from the soil by crops, and by drainage, or otherwise, is fully restored by corresponding amounts derived from free nitrogen through the agency of microbes, or that this is the sole or even main source of the nitrogen of leguminous crops on average soils.

The Rothamsted experiments show that the previous accumulations of combined nitrogen in the soil must be the source of a large portion of the nitrogen of leguminous crops, and that the frequent repetition of such crops does not prevent an appreciable diminution of the nitrogen of the surface soil.

The evidence thus far available seems to indicate that under ordinary conditions of farm practice the microbes concerned in working up the supplies of combined nitrogen in the soil are quite as important factors in the nutrition of leguminous plants as their symbiotic microbes that make free nitrogen available.

W. B. LAZENBY. (1)

Sherbrooke Exhibition.—This show seems, from the accounts in the papers, to have been successful, the attendance having been very large, whether on account of the attractions of the agricultural division or of the numerous "side-shows." I do not know. One point I must remark upon: there was no competition for the hundred dollars so liberally furnished by the Hon. Mat. Cochrane for the best *hacks*! How the Eastern-Townships' farmers can persist in driving those four-wheeled buggies of theirs over the lovely slopes of their farms, and along their pleasant grass-bordered roads, when they might enjoy a glorious canter on the backs of well bred roadsters, I never could understand. How, on earth can they expect the English officers who come over in hopes of picking up remounts for the cavalry to buy their horses if they will breed nothing but upright-shouldered harness-horses? Ride, gentlemen, do ride, if only for your health's sake. You will soon learn the difference between the two styles of horses, and breed in accordance with it.

(1) Rather stiff reading, but well worth an hour's study.

A. R. J. F.

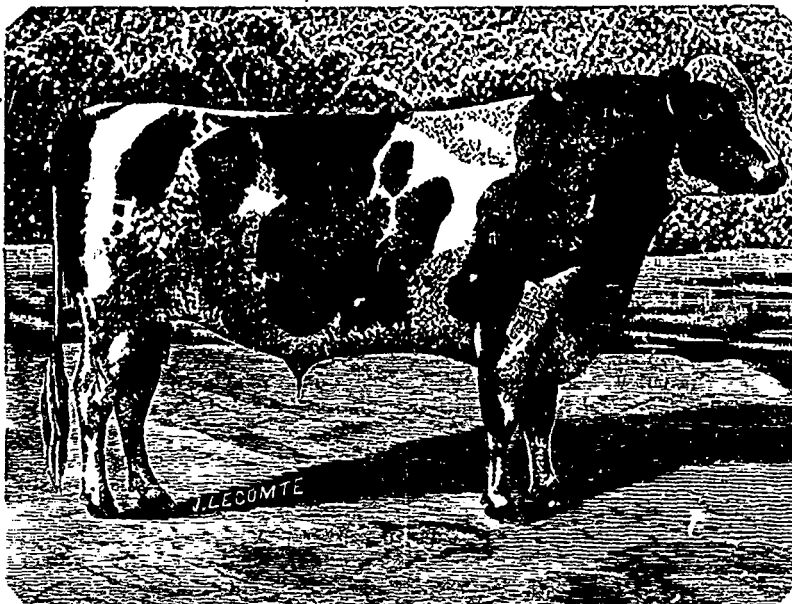
A propos of the term *thoroughbred*, as applied to horses, I saw the following advertisement in the Montreal Star of the 5th September :

"For sale : a thoroughbred mare, bred from the best trotting stock ;" which is of course an absurdity.

A. R. J. F.

We give a portrait of the great Holstein bull Netherland Alban 4584 (A. R. 34), winner of the \$50 first prize in the aged class at the Syracuse State fair, as mentioned last week. He is a bull of the milk-and-beef form ; head proportionate ; neck of medium length, fine, neatly joined to head and shoulders ; chine straight, broad and open ; loin and hips very level and strong ; escutcheon fair size, of excellent quality ; handling superior ; secretions very oily, abundant and yellow ; style and bearing very fine. His got, as well as himself, have met with great success in the show ring, and from present indications Netherland Alban gives promise of taking a position second to none as a stock-getter. He was got by Netherland Prince 716 (A. R. S), out of Albino 2654 (A. R. 204) ; and was dropped April 29, 1885. He was bred by Messrs. Smiths, Powell & Lamb of Syracuse, and sold by them to his present owners and exhibitors, Messrs. J. B. Butcher & Son of Pawling.

Country Gentleman.



FIRST PRIZE HOLSTEIN BULL NETHERLAND ALBAN.

SEASONABLE NOTES.

STACK-BUILDING.

Last week we promised a few remarks upon the art of stack-building, and commented upon its decadence and the demoralisation of harvest work in consequence of low prices and bad times. Stacks may be built, on saddles or on the ground. It may be presumed that the saddles is an improvement and innovation upon the other system of building on a straw bed. Be this as it may, there has certainly of late been a reaction towards the simpler question. Saddles are used for two objects—as a means of keeping out vermin, and secondly for purposes of ventilation, and for bringing corn more quickly and more uniformly into condition. So far as vermin are concerned there is but little advantage gained by their use, as mice are imported in sheaves straight from the field, and rats climb into ricks through the carelessness of farmers and labourers, who habitually leave heaps of rubbish, stakes, and loose straw in the neighbourhood of ricks. Another reason which favours the building of ricks upon the ground is the now common habit of stacking corn in the field, where it is thrashed out by means of portable machines. Saddles

are fixtures, and ricks are set up where most convenient, and hence an extemporised bottom is preferred.

The bottom ought to be made on a dry situation where water is not likely to lodge, and is best made with straw, which is put down about 18 inches thick on the site of the future rick. If a round stack is desired, the best means of proceeding is to set up a harvest fork perpendicularly in the ground, and to loosely tie a piece of string from 4 to 5 yds. long around it. Then stretching the string, describe a circle around the fork, and make the bedding exactly within and up to the circle as formed. In this way a perfect circle is made, and after the bed has been made level we may proceed with the work of rick-building.

One plan is to commence in the centre, by setting up two sheaves just as if we were going to make a stook. They are placed in an A form, with the crop ends upwards. This must

form the basis of a solid cone of sheaves, built up as a round stook in the centre, which makes a nucleus around which sheaves are built. The crop ends are laid towards the centre, which at once presents a full appearance. The butts only, lie directly on the straw, and the heads all lie on sheaves. Thus the work gradually is carried on until the outside is reached, and the rick is then considered to be fairly started. To begin at the outside is wrong in principle, as each sheaf then rests with its head on the bottom, and will be found to be-

come fusty or mouldy from damp. After the first layer is laid this order is reversed and the builder begins his second course at the outside, and ties them in by a second layer laid upon the bands of the first, which securely ties them in, and prevents-slipping. A third layer, and a fourth are then laid until the centre is reached. Successive layers of sheaves are added, each one commencing at the outside, care being taken that the middle of the rick is kept sufficiently full to give a slight inclination of the butts downwards. This prevents rain from finding its way towards the centre from the outside. If the middle is too full the rick will slip, but if properly built, the tendency is only to grow out at the leg so as to form that perfect form which may be likened to a peg-top, or the lower part of a pear, gradually swelling out evenly all around until the eaves are reached.

RIGHT AND LEFT STACKING.

Good stack-makers take a great pride in their work, and love to see a well-built and pleasant-looking object, when their work is completed. For this purpose they endeavour to build right and left the meaning of which phrase is worth explaining. When sheaves have been well set up in shork the straw becomes bent, and on lifting the sheaves from the ground the butts are not square but levelled, or set at an angle. In

putting on an outside row the sheaves are turned, so that the butts lie uniformly, and all in the same direction. The long end of the butt is turned backward. In the succeeding row the long end of the butt (that which lay upwards in the stook) is turned forwards, and this alternation of the long ends backwards, and forwards is afterwards seen in the shaven and trimmed rick. A stack so built, after *shaving*, reflects the light in opposite directions, and looks very well. (1) This involves but little trouble to a skilled man, for instead of turning the sheaves he turns himself, and alternately builds around his stack, first hopping around to the right and the next course to the left, hence the expression right and left stacking. The course are kept as regular as courses of bricks, and great pains are taken to build firmly, as explained in last week's "Seasonable Notes."

THATCHING.

Immediately a rick is completed it ought to be thatched without an hour's delay. When the stack-maker descends the thatcher should climb the ladder and take his place. Thatching may be done with straw ready drawn, or with straw drawn by the thatcher as his work proceeds. The former is the general practice in the south, and the latter in the north. The details are not easy to describe, but the extremely neat work turned out by north country men is sufficient proof that undrawn straw may be laid on with quite as good effect as yelms or steeps.

ROPING.

When drawn straw is used roping and thatching proceed



GALLOWAY CATTLE, THE PROPERTY OF SIR ROBERT JARDINE.

LAYING THE EASING OR EAVES.

The body of the rick is called the leg, and a good leg is an important matter even to a rick. It swells in size to the top, and grows out by its own weight into a form which throws off the wet all round. When the leg has been carried up to the proper height the builder then prepares to lay the easing. This he does by first filling the middle well, and the easing course is made by turning the long ends of the butts upwards instead of sideways. These long ends project beyond the outline of the rick, and still further protect it from rain. The roof is thus commenced and is continued by gradually drawing in the sheaves until a regular cone is produced. The extreme top is made by building the sheaves in a solid cone with the crop ends upwards, forming a solid cone ending in a blunt point. This is careful rick building, but is seldom seen nowadays. We have, however, known many old rick-makers who observed all these rules, and many others which it would be tedious to put on paper.

simultaneously the tar band being secured with long or short stack stakes. When undrawn straw is used the thatch is first laid on, each handful being pushed into the butts of sheaves and feathered over each other so as to draw off wet. The roping is done with straw ropes, the making of which gives employment during many a wet day long before harvest. When straw ropes are used the first thing is to put on an easing rope just below the eaves, and this is done with care, straining it up tight with the aid of long forks and beaters. Each rope is then knotted to the easing rope and used over the apex of the rick, and tied tightly to the easing rope on the opposite side of the rick. Supposing such a rope to be fixed, a second is tied to the easing rope about one foot of the first, and this also passes over the apex, and is tied on the opposite side. Three men are required, one man on each side mounted on a ladder and one man on the top of the rick passing the ropes properly over the apex until they form a solid cone and sharp point. The thatch is prettily worked with the ropes at the eaves like the straw in a bee skep, and when all the ropes are on a neat ornament of cut straw sets off the now completed rick.

(1) In the S. of England, every stack of grain is shaven, or shorn, after setting, with an old scythe blade set upright on a pole. The grain is then safe from birds and rain. A. R. J. F.

Various patterns in roping are used, the most ordinary being the sectional method just described, every rope passing over the apex, and a lozenge-shaped arrangement in which the ropes cross each other on the sides of the roof in diamond pattern.

CARELESS STACKING.

is but too common. Some persons may read the above remarks with impatience, but they are nevertheless according to good practice. To any one who has been brought up in the school of careful farming the loosely made irregularly-formed ricks now too often seen seem to him to be slovenly and unworkmanlike. Laying on sheaves with a fork appears to him quite inconsistent with good work, and sheaves laid on anyhow and with no attention to the set of the butts savours of men untrained neatness of execution.

TRIFOLIUM.

Where wheat land has been cleared a large breadth of trifolium has been got in during the last few days. The cultivation is exceedingly simple, and consists in harrowing in 20 lb. of seed per acre on the stubbles. The success of the crop largely depends upon its being got in during August or early September.

JOHN WRIGHTSON. (1)

THE DAIRY

FOOD IN WET WEATHER.

The present summer, so far as it has passed, cannot be reckoned an over average one in the Dairy Department, though, perhaps, it is quite as good as we have lately been accustomed to. The outstanding reason of this is the excessive rainfall which we have had all through the haymaking season, and which, it is possible, may continue through harvest, though we have had intervals of hot sunny weather now and again. But a cold wet time is just as great a drawback in the dairy as it is in the cropping world. We do not, of course, have the plague of flies so badly in such a season, for bright sunshine is needed to develop these in all their intensity; while a warm, sunless day is that in which the cows manufacture the most milk, and with the greatest comfort to themselves. Cold wet weather, however, has two drawbacks to it in connection with cows: first the physical discomfort to the animals themselves such as a human being feels when out in the wet; and, secondly the additional discomfort of cold, watery food. It is a great help in our own case to be able to get a good, comfortable, square meal after we have been out in the storm, and the knowledge that something of this kind is in store for us enables us to brave the elements with impunity. But if we had to work on in the wet and cold without any compensation of this kind, it would indeed be hard lines, and it is just possible that many would succumb. Yet this is exactly what many animals of the cow kind have had to stand all summer. There is not only the wet hide and the cold, but the natural food is not up to its usual quality, so that those animals which have to make milk on the food they pick for themselves have fallen on evil times indeed. In a wet, sunless summer, the grass and other crops do not contain anything like the same nourishment, weight for weight, which they do in a good season. There is a much larger proportion of water in their composition, while it is doubtful if even the lessened amount of solid matter which

remains contains the same proportion of nutrient ingredient as before. Thus animals left to look for themselves have more to endure from adverse external circumstances, while they have less inside to enable them to withstand it, in seasons like the present.

The effect of this is easily seen in the produce. It may continue in similar quantity as it would do under more favourable circumstances—it might even be yielded in larger quantity—but the quality is rendered ever so much inferior. Cheese-makers and butter makers are aware of this, for they find they cannot get so much produce from a given amount of milk as they do in a more genial summer. Now it is part of the mission of man to counteract the evil deeds of nature, and beat her, and achieve success in spite of adverse surroundings. This is especially the case in farming which might almost be defined as a perpetual fight with the above mentioned dame, trying to bend her to certain ends or purposes. If our cows have to fill their rumens with large quantities of watery grass, then we must help up the total solids and the albuminoids ratio with some concentrated food indoors. Naturally the one which will occur to the minds of most farmers will be cotton cake, but it is worth while again repeating the warning that it is very easy to spoil the cheese or butter, as regards flavour, by a careless use of this concentrated food. The late Dr. Voelcker recommended the undecorticated form for use in spring and autumn, when the grass was more watery and laxative, and its use may be recommended here for a summer like this, where the laxative state of matters becomes normal right through the season. But Dr. Voelcker gave a stronger recommendation to a mixture of beans and oats ground up together for dairy purposes, as yielding good results without any of the trouble pertaining to cotton-cake. But meal, has one serious drawback which does not obtain in the case of cake; it requires to be mixed with water and to be used fresh. Meal must be made into dough or mixed with chop and water before cattle can use it, and all this means extra daily labour. Cake is an exceedingly handy material. A heap of it can be passed through the breaker at intervals when other work is not pressing, and be thus kept in readiness, while it is easily and quickly divided among the cows while in-doors at milking-time. It seems to us, therefore, that a food which could be handled as a cake, but which at the same time had all the desirable qualities of ground beans and oats, would be a great acquisition on a dairy farm. We do not know if the manufactured cakes advertised by certain well known firms approximate to the points we have mentioned, and it is not our business to puff them: but if they do come near this standard then they cannot fail to be valuable foods.

The operation of mixing or damping meal does not give so much trouble in winter time, because a lot of other similar work has to be carried out in any case, while in a season like this some extra food must be given. The benefits to be derived from the consumption of tares or other green forage are not very manifest. Such crops participated in the watery and weak composition common to all in a season such as this, while the pastures are generally overflowing with grass such as it is, and the stomachs of the cows are crying out for something dry and concentrated. In a hot dry summer green succulent forage is of the greatest importance for making good the deficiencies of the bare hard pastures, but we must make a change and manipulate our materials in another way when the season is different.

Eng. Ag. Gazette.

WINTER RATION FOR DAIRY COWS.—Kindly give me your advice on winter rations for my cows. They are ordinary sized Suffolks, kept solely to supply new milk, quality no object. I want to keep them on produce of the farm as near

(1) I fear we are too far north for this crop.

as possible, *i. e.*, oat straw (good), kohl rabi, and mangel, besides which I give them two bushels of grains per cow per week. Please state requisite quantities of above; and if you recommend the addition of any concentrated kind of food, would home-grown oats suffice? I have no convenience for steaming or giving warm mashies, but usually pulp roots and cut straw, mixing in other foods, and allowing to stand some hours—C. M. (Give your cows all the food they will eat up cleanly and with relish. Malt culms are good for forcing quantity of milk, and with brewers' grains will answer your purpose; but you ought to keep up the strength and condition of your cows at the same time, therefore should use some kind of corn as well. Crushed oats, bean, pea, or maize meal, whichever may be intrinsically the cheapest, should be used with the chaffed straw and grains. Your roots will be found very useful pulped and mixed with the chaff, grains, malt culms and meal. But your cattle must not be fed wholly on chaffed food; they want hay or straw, unchaffed, for rumination. There is no need to steam your chaff; the same end will be attained by mixing pulped roots with it, or otherwise wetting it, and letting it lie in a heap to soften. Perhaps nothing is so potent as brewer's grains and malt culms for forcing a large flow of milk. Warm water to drink is also useful. J. P. S.)
Eng. Ag. Gazette.

An exhibition of sublime impudence has been made by the Legislature of the United States in the passing of the Meat Inspection Bill, intended to remove the causes of the restrictions placed by France and Germany upon American pork, and of English objections to the free ingress of American cattle. The bill authorises the President, when satisfied that unjust discrimination has been made by a foreign State against the importation of any American product, to prohibit the importation of any product of that State which he may select, by way of retaliation. This childish "tit for tat," we are told, is authorised when "foreign restrictions are not removed after the United States provides the inspection required by foreign countries." In other words, foreign countries are to trust to American inspection, and not to their own; and if not satisfied with the former, the President of the United States will take revenge by arbitrarily shutting out of his country some foreign product. For example, if we do not choose to admit American store cattle to mix freely with our valuable herds on the mere *ipse dixit* of American inspectors to the effect that the animals are free from disease, the President may shut out from the United States all our cotton or iron manufactures. For a country which maintains the most prohibitive tariff in the world to attempt in this arrogant manner to force its products upon foreigners is a little too grotesque. It may be safe to play such tricks with a staunch Free Trade, a country like our own; but, if practised on France and Germany, their perpetrators will probably learn that two can play at the game of retaliation. If French manufactures are shut out of the United States because France will not receive American trichinised pork, it is not unlikely that American wheat and maize will be shut out of France.
Eng. Ag. Gazette.

TYPES OF SHEEP.

The difference in feature, form, and fleece, habits and aptitudes, among breeds is an interesting study if nothing more. Judges, no doubt, attach weight to these matters when acting at shows, and do not give a prize to any sheep which is not distinctly a characteristic specimen of its breed. It is certain that a "Southdown man" cannot properly judge Hampshire sheep, or a "Hampshire Down man" Southdown

sheep; and hence we may conclude that it is somewhat unfortunate that any judge should be called upon to decide between animals of more than one breed. Single-handed judging is in my opinion a better arrangement, for when two men, one a well-known Shropshire breeder, for example, and the other an Oxford Down breeder, are judging these two breeds the advantage of two heads is lost. The Oxford breeder would be disposed to follow his colleague in the Shropshire classes, and *vice versa*. If not, he will lean towards the particular type which he has always studied, and believes to represent perfection. The consequence may be that an animal is decorated which, however excellent, is not a characteristic sheep of his own particular breed. (1)

SOUTHDOWN AND HAMPSHIRE DOWNS.

These two breeds are easily distinguished. In the Southdown is seen absolute perfection of form. We shall never see him surpassed in this particular by any breed. The plum like outline, short and carefully trimmed coat, and small amount of waste or offal are distinguishing characters. In size they are much less than the Hampshire Down, and as is often the case with small animals, their symmetry is beautiful. The colour has become progressively lighter during the last thirty years, and in some of the specimens (not, however, decorated) the face might almost be described as white, or very light grey. The head is dish-faced or flat in profile, and the ears are short and round, and often light in tint. The colour of the face of most of the prize-takers was a light fawn.

The Hampshire Down is much larger and bolder in form and falls little behind the Southdown in fulness and symmetry. The old faults of neck, shoulder, and rump have long disappeared under careful breeding, and for width of carcass and utility of form they will give way to no breed. Still, the Southdown must be considered as superior in its exquisitely rounded contour of form. The head of the Hampshire is almost black, and well covered between the ears, which are long, and fall away from the head, giving great width to the poll. This lopping of the ear may be carried too far, but must be considered as characteristic. The short ears of the Southdown are more erect, and are set rather more within the outline of the head. The nose of the Hampshire is thick and bold in the ram, and more rounded than in the Southdown. The Hampshire is cleaner under the throat than the Shropshire, as already mentioned. It is next to the Lincoln in actual weight. The chief point of excellence in the Hampshire Down is its extreme earliness of maturity. No breed can touch it in this particular. It is as a lamb that he is seen at perfection, whereas, with all respect to a recent result, Cotswold lambs cannot compare with them in this respect.

THE APIARY.

TO TAKE OUT HONEY.

To the beginner, the taking out of the surplus honey is difficult and disagreeable. Doubtless some bee-keepers never get beyond the point of beginning, at least they come to a halt when it is necessary to face a big colony of bees and take their surplus.

A beginner, last spring, writes: "You told me I could do anything with bees. Perhaps I may sometime, but all I can do now is to let them alone. I 'hefted' my hives the other night when the rascals were asleep, and found them so heavy

(1) Wm Rigden, my farm-tutor and the best judge of Southdowns in England, refused, at the Norwich show of 1852, to judge Cotswolds and half-breeds, because, as I heard him say: He did not know anything about them.
A. R. J. F.

I could not lift them. Must be a pile of honey there. Now, will you please inform me how I can get the honey out and live. The colonies have grown wonderfully. I believe there must be a million bees in one hive. It's my opinion you would not dare to touch the big colony yourself."

The hives are double, or two-story hives, having in each upper story fifty-six one-pound boxes. Their removal is easy, safe and quick, if the bee-keeper lose the fear of the bees. If there were only one colony, the bee-keeper might take his own time in removing the honey, but there are three colonies, and hence, must be no delay, else the bees from other hives will take a hand, and help themselves, fight and kill each other, and possibly take liberties with the bee-keeper. First drive the bees into the brood chamber with smoke introduced into the top of the hive. Then remove the second story entire and carry it to the house, or some place where bees cannot enter. Do not leave the hive uncovered while doing this. Cover with a sheet, or better still, place upon the hive another second story. In the house, bees clinging to the frames are dislodged and return to the hive. Remove the filled sections, and replace with empty ones, or sections with foundation. Take out only the honey capped on both sides. If a half dozen cells uncapped appear, the section may be placed with the perfect honey. This, however, is not a good way, if the honey is to be shipped to market, or if it is to be exposed for sale anywhere. Return the imperfect sections and the new ones, that is the second story entire, to the hive as quickly as possible for the work there is interrupted, and will not go on again till the half story be in its place.

It is a better way, perhaps as there is less disturbance, if one frame be removed at a time, the hive quickly covered, the frame carried to the house and treated as the half-story was. Taking one frame at a time allows the bees to begin at once the work of repair, and before the last frame is taken out, the first has been mended and refilling has begun.

In removing honey in any shape there is more or less breaking of brace-combs, and in these brace-combs are usually a few cells of honey. These are broken and the honey liberated. The odor of honey travels faster to bees than to man, and therefore great care must be taken that robber bees do not get in, attracted by the running honey, when the hive is open.

Use the smoker sparingly: Give them just enough to remind the bees that you are in command. Wear a veil and if you are going to jump every time a bee looks at you, (1) wear gloves. But usually one or more bees will get inside in spite of veil or gloves, and then one is equal to several outside, and the frantic attempts of the bee to escape, lead the beginner, in telling the story of his marvellous rescue from a terrible death, to inform his listeners that more than a thousand bees smote him right and left, and nearly made an end of him.

GEO. A. STOCKWELL.

CRIMSON CLOVER ONCE MORE.

EDS. COUNTRY GENTLEMAN.—Through the kindness of Dr. A. T. Neale, director of our Delaware State Experiment Station, I am able to present your readers with some further information regarding Crimson clover that I am sure will prove of interest. Dr. Neale and his able corps of assistants have given this clover considerable attention, and have brought out much valuable information.

This clover grows wild in Southern Switzerland and Northern Italy. It was introduced into France about 1830, and is so well liked and so generally used there that the name French clover is often applied to it. Seed from five different varieties of this clover is offered on the European markets.

(1) Bees never trouble me much; but Dr Girdwood dare not go near his own hives!

A. R. J. F.

These varieties vary in color of blossom and season of blooming and also in hardiness. The plant is noted for stooling, for deep rooting and for rapid growth. Fifty flower stalks to a single root have been repeatedly noticed, and seventy stalks to one root have been reported. Roots have been followed more than four feet down into a heavy clay, so hard that spades had but little effect. The plots at the experiment station made an extremely vigorous growth. During the fall and winter the ground was not only concealed but completely protected against freezing; for with a temperature approximately 14° above zero the soil was found soft and free from frost directly under the clover, while that unprotected was found frozen hard. The plants remained green, and at no time during the winter did they show any indications of suffering from cold. On May 12, the crop was in full bloom. It was then cut and weighed, then plowed under as a green manuring. The maximum yield was 13 tons and 400 pounds per acre. A chemical analysis showed that this amount of green clover per acre was equal to two tons and 600 pounds of very dry hay; also that the 13 tons of green clover contained 115 pounds of nitrogen, 131 pounds potash and 35 pounds phosphoric acid. To secure this plant food in form of fertilizer at market price would have cost \$24. Of this amount \$17, or 70 per cent. of the total is credited to nitrogen, that element which clover can secure from the air, while 30 per cent. is credited to phosphoric acid and to potash, elements which can only be secured from the soil.

Mr. E. H. Bancroft, one of the most intelligent and successful farmers of Kent county says of this clover: "It is first class for soiling, and for ensilage there seem to be no limit to its usefulness. Its season of growth and maturity enable us to fill the silo in May and provide a supply of the best ensilage, and the supply may readily be made adequate to the requirements of the entire year. To plow down for green manuring, no other plant of the same season has yet become known here that can approach it in value, for cheapness of production, for quantity of crop, and for fertilizing qualities. Taking it all in all, it certainly impresses these who know it best as offering possibilities to the agriculture of a vast portion of our country never before anticipated."

Mr. Jacob G. Brown, a veteran fruit grower of Central Delaware, says: I have known this plant during a period of about five years, and each year increase my estimation of it as a forage crop. There is no other adapted to this soil and climate that can in any way equal it. It is the most easily seeded, will grow on the poorest soil, and under conditions when other grasses would utterly fail; will produce the largest yields, either for use in the silo or for hay; in quality not excelled. It is the most wonderful restorer of poor or worn out soil in existence. I verily believe that with it land can be brought into the highest state of fertility without the application of a dollar's worth of manure."

The Wynkoop Bros, of Milford have raised this clover six years, and expect next year to have nearly ninety acres of it. Mr. P. P. Wynkoop says: "Scarlet clover is a first class forage plant, for use either as hay, as ensilage, or for soiling, as a crop to turn under for green manure, its value is very great."

Upwards of four hundred and fifty bushels of home-grown seed, have found an eager market in this little State alone during the past month. This amount of seed if properly used is sufficient to cover an area of more than three thousand acres. This will give some idea of the popularity of this plant among those who know it best.

Kent County, Del.

E. G. PACKARD.

The seed of this plant is advertised for sale by Mr. HENRY NUNGESSER, 65 Pearl St., New York.—EDS.

Country Gentleman.

THE POULTRY-YARD.

CARE OF HALF-GROWN TURKEYS.

It is a pleasure to care for young turkeys in summer. Their period of infantile helplessness, when they seem to court disasters of all kinds, is past, and those that have managed to survive the inclement spring or have been put out since, are now thrifty and strong, full of life and vigor, and especially energetic in their search for something to eat. The larger part of their daily food at this time should be insects of all kinds, and fresh, tender verdure, and the flock should be induced to travel far and wide in search of it. Like children, there is no tonic half as good for them as plenty of fresh air and exercise.

Until a month or six weeks of age poults should be housed at night in a coop close enough to keep them from running out in the dew and rain; after this time a larger and more open apartment is required, where the mother hen only can be restricted, and in which low perches may be placed, for growing turkeys, are always healthier, and safer too, after they begin to roost at night at some distance from the ground. When from two to three months old, according to the quality of their growth, the brood should be allowed to roost out of doors, on low limbs of trees or on poles eight or ten feet from the ground. This the flock considers a great promotion, and will come home an hour or two earlier in the afternoon in order to arrange themselves to their satisfaction. I have searched for my turkeys far and wide, and found them at last comfortably settled on their perches, looking down at me from their superior height with much condescension.

The food given them at this time should be the nicest of the table scraps, or simply bread moistened with sweet milk, but when the wheat is harvested and threshed, then whole sound wheat may be given. After the turkeys begin to roost in the trees at night, they are down in the morning and off to the fields without waiting to be fed, but unless water and shade are convenient here, they all come back again about ten o'clock. They prefer cool clabber or thick buttermilk to drink, and after refreshing themselves with something to eat and drink, they drop down on the grass under the trees and rest until the afternoon begins to grow cool, when they all return to the fields again. They could get on very well without any supper, but it is a good plan to offer them something as a reward for coming home.

The younger poults, after being turned out of the yard in the morning, seldom return until night, and not always then unless somebody goes after them. They are very fond of the orchard, and as it is cool and shady out there, it is better to carry them a lunch of bread and milk at noon than to bring them to the house. When you first come in sight of them, they are probably enjoying a midday nap, but the sight of you reminds them how very hungry and thirsty they are, and they beg most clamorously until the pan of food is set before them, when they all jump in it at once, and scream at the top of their voices all the time they are eating. In a few minutes, though, their appetites are fully satisfied, and they walk off and leave you, eating grass and clover, as if anxious to get a taste out of their mouths. (1)

During the very warm weather turkeys of all ages should be fed little or no heat-producing or fattening food; after they are old enough to eat grain, wheat, oats, barley and buckwheat are to be preferred to Indian corn. Everything that is given them should be of good, sound quality, and a somewhat smaller quantity should be allowed at each meal than the flock would like to receive. There is nothing more wholesome for them than good milk, but it is better to allow them

this twice a day, at morning and evening, and keep fresh water before them at other times.

Some of my neighbors boast of not feeding their turkeys at all after they are a month or six weeks of age, but this I think is a mistake, for I notice in the fall that when comparing the weights of our respective flocks, the greater weights of mine more than repay me for the extra food and attention. By thus being fed regularly, their development is both rapid and substantial; they have large frames, and as they already have some flesh, can much more easily be made to take on more, so can be gotten ready for market earlier, or developed into finer stock turkeys.

During the growth of turkeys they should be examined every little while to see if they have become infested with vermin, and when this is found to be the case, a drop or two of pure lard should be rubbed on their heads and under their wings and thighs, the mother hen being also treated in the same way. This must only be done in warm, dry weather, and the brood protected from rain for a day or two afterward. Fierce, beating rains, however, are always dangerous to poults until they are several months old. I have found a whole flock, after being exposed to a hard, beating shower, lying apparently lifeless, or just gasping for breath, and the most strenuous efforts were required—warming, drying and rubbing their limp little bodies—in order to restore them to life.

The owner should be careful to keep himself informed of the range of his flock, so that no time may be lost in looking for them wherever this becomes necessary. Turkeys are usually very systematic in their habits, have a regular route when they start out in morning, a certain place to rest at midday, and return home at evening through different fields from the ones they traversed in the morning.

Another and most important reason why we should keep informed as to their range is that we may know where to look for them when they fail to come home at night. Many poultry keepers by neglecting to do this lose by the depredations of thieves, both human and otherwise, the reward of their whole season's work. It pays to take care of every crop that is nearly made, and yet, just at this time, many of us relax our watchfulness, and then rail at our "bad luck."

A FARMER'S DAUGHTER.

GROWING SAINFOIN HERE AND ABROAD.

EDS. COUNTRY GENTLEMAN.—I read Mr. Howatt's article about "sainfoin," p. 584, with great interest. I said this revolutionized culture in certain localities, I proceeded to look it up, and found that in England, on heavy chalk soils, it is highly valued. Then, said I, it will work on heavy soils with hardpan under them. I propose to sow it next spring on such, preparing it as advised unless you now advise otherwise. Please tell me where I can get the seed, and the price, and add such other information as you think will be useful.

R. H. M. Troy, N. Y.

There are no certain localities for the growing of sainfoin; any locality, from Maine to California, will suit it. In England, to make the most of all crops, we adapt them to soils.

As a general rule there it is grown on chalky soil, chalk being a geological formation abounding in Europe, and nearly altogether absent here. It consists of a very large proportion of carbonate of lime. England is probably the best country in the world in which to learn farming, every detail being properly impressed on the mind, but if we were to follow it as practiced there, we should be a nonentity in the science. Even here different sections require different practice, if not an altogether different crop, and none but the thoroughly-vers-

(1) Plenty of young onions, please.

ed, practical man can do it. Such a one studies soil and climate, and adapts his crop, astonishing the natives that such should be grown in their vicinity. In England timothy is grown on low lands, what you may term wet, and is a fourth-class hay. Ruta-bagas and mangold-wurrels are sown on ridges formed by throwing two furrows together and dropping the seed on the ridgelets, and at 30 inches to 3 feet apart, (1) the manure being thrown into the centre. From their moist and wet climate, these ridges are to protect the roots from the water, and to draw all the heat and sunshine to the roots. Should we adopt this system, our ridges would become a dust heap, from excessive heat, and no moisture obtained for the roots. Flat culture is our method for carrots, swedes and mangolds, and our imported practical men soon learn these climatic differences.

We all know that corn requires a deep and friable soil, but the heaviest yield I have seen east or west was in Orange county, N. Y., on a hillside and top, stoncs and rocks, plowed with one horse and a one-handle plow, running to a stone, over a stone and dip in again. When finished it looked like an orchard ground where pigs were sent in without rings in their noses to root it. Corn was dropped and covered by hoe, and in ordinary straight rows—so much as that the crop was plowed by same plow, hen manure and plaster to the hill. It was a fine crop, and a paying one. Then, again, wheat with the general farmer requires his best land, well plowed, &c. In California I have grown this crop 40 to 75 bushels to the acre—one rough plowing, seed and harrow. Before harvesting, the land was as hard as a macadamized road, and our heading machine (we do not save the straw) had to go around the great cracks in the soil.

I cite the above instances that your readers may not think they must have such and such a soil to grow such and such a crop as Brown, Jones or Robinson may recommend. Of course the nearer that they can come to it the better. Try, try, and you will succeed. R. H. M. is quite correct on his heavy soil, plowed this fall; earlier the better. The stiff hard-pan will prevent the roots traveling to a great depth to exhaust the foliage, and they will throw out plenty of feeding fibre. No chalk or rock bottom is required, and the yield on such soil as his should be three tons to the acre, and No. 1 aftermath for feeding. I plow the seed in, thus giving it a firm hold in the soil. The roller must be used, and it will quickly germinate; if no roller, hull it, when you will require more seed, as in the process very many of the seed will get injured.

General price of seed is \$2 per bushel of 25 lbs, \$8 per 100 lbs. Any reliable seed-house will give you good seed; this is a particular item. When I passed my examination as farmer and gardener, I was asked how I grew such and such crops and plants. Answered satisfactorily up to last one—"Did you ever lose a crop?" "No sir." "Then I was told that I did not know how to grow it. I thought it then a very absurd question, and a pull-down to my dignity. If the same question were now asked me, I should say it was a very wise one. You cannot grow good crops from poor seed. Some years ago I got fourteen acres of land into first-rate condition—a sod plowed in fall, planted for spring with potatoes, to be followed with carrots to carry a large number of cattle: Sowed my carrot seed, but not one came above ground; thus my whole expectations were blasted, and it caused a very serious loss. It is not my place to recommend publicly any

(1) In the North and in Scotland. In the South and the midlands, roots are grown on the flat, as they ought to be here, but the chief good farmers in the province being Scotch, the system of sowing on drills obtains.

A. R. J. F.

particular firm: the columns of this paper give the addresses of reliable seedmen, who would not furnish you poor seeds gratis.

GERALD HOWATT. (1)

SWAMP LAND AND MUCK.

EDS COUNTRY GENTLEMAN.—I observe on page 608 a letter from C. N. L. headed "Swamp Muck" and in regard to the question might say that I have about 15 acres of a very fine cedar swamp, which contains great quantities muck, and fully as deep as is mentioned by C. N. L. It also has clay subsoil.

Three years ago I commenced cutting the timber and clearing the land and now have about 100 acres under cultivation. The stumps are easily pulled, especially if the brush is burned at the proper time, or when the soil is dry enough to burn off about three inches of the top woody substance. This leaves the stumps on top of the muck, they are then very easily turned over, piled and burned. I have grown on this ground very nice winter wheat, and seeded with timothy, and this season have the finest stand of timothy in this part of the country. I find that barley, short-strawed peas and fodder corn do nicely on the soil. This season I set out a vegetable garden as an experiment, and to-day have about two acres of as fine cabbage, cauliflower, beets, turnips, mangolds, celery, beans, carrots and onions, as will be found anywhere. It cost me about \$1.200 to drain this swamp, and it does the work effectively.

Regarding the use of muck for top dressing, last fall I drew six wagon loads of muck, and during the winter threw on it about 15 bushels of ashes, and two or three bushels of hen droppings. This was put near the house and my farmer's wife threw on it all the soap-suds from the house. This spring these ingredients were thoroughly mixed, turning them over several times. It was my desire to plant corn on a piece of about two acres that was very much impoverished. I had my men get the land in good order, nicely marked out, and just before planting put a teacupful of this muck mixture in every hill; then planted the corn, using a planter. The result has astonished me. I have now as fine a piece of corn as I have seen in a long time, with the exception of a couple of rows in which I did not put the fertilizer; these are small and sickly.

W. S. NILES.

Wellington, Ont., Aug. 7.

FOOD RATIONS.

Your correspondent "J. W." (Lambourne), writing to the GAZETTE last week, says that he considers rations based upon a general analysis to be mere guesswork, and that nothing short of a special analysis is of any value in the matter of calculating rations.

As a good practical farmer (by the term "practical" I mean one who combines theory and practice; none others can in any sense of the word lay claim to or be considered practical farmers), and the writer of a large proportion of the articles on food rations which recently appeared in the GAZETTE, I would seek to inform "J. W." that the tabulated analysis of the various foods is from no less an authority than Sir J. B. Lawes, and the results are obtained from experiments embracing a large number of analyses, the average being taken as accurate, or representing the general bulk of each respective

(1) I feel sure that sainfoin is going to prove a very useful crop here on the hilly parts of our farms.

A. R. J. F.

food. Such data, coming from such a source, I hold to be as good as any special analysis, of any food composing a ration. Practical men can soon see whether the standard so obtained suits their purpose best, and modify it accordingly, heavy milkers getting a little more, and inferior ones kept to the standard. If "J. W." considers for a moment, he will see that my argument is sound. Let him have the soil of any field of, say, twenty to thirty acres analysed, and he will find that if he takes samples of earth from each field, say from six different parts of the field, he will not have a uniform analysis. This being the case, he need not expect uniformity in the analysis of the product from such a field. Some fields may be found of the size above specified, that will give an uniform analysis, but they are very few. That being the case, farmers who consider their own interests are satisfied to keep their money in their pocket, and accept Sir John's analysis, and make out their ration accordingly.

Personally, I have fed upon the ratio theory for some years, and am perfectly satisfied with results. I should as soon think of flying as going back to the old rule of thumb, or rather tradition of the elders, system of feeding. I can obtain more milk of high class quality, and at the least cost, and still maintain my dairy herd in the best of health and condition, four items seldom obtained by the old system. At the end of the feeding season it is quite a treat to see the beauties when they leave their winter quarters for the pastures.

NORTH ESSEX.

CALF-REARING.

The present high price of young cattle, concurrent with their security, has turned the attention of all owners of cows, to the advisability of rearing young animals more than they have been in the habit of doing, and at the present moment newly dropped calves are at a premium in some parts of the country. Calf-rearing went considerably out of fashion in the good times, because it involved such an immense amount of personal attention, and some of the big swell farmers were too high and mighty to be troubled with that sort of thing but preferred to buy the cattle they required ready made. The increasing difficulty of getting these at a moderate price, however, has changed the attitude of many. Buying stores at £16 per head and selling at £18 to 20, after caking for the greater part of a year, is enough to make any man sweat more than if he were pitching hay in a blazing sun on a calm day, and it is an experience that has been so common of late that there is no wonder the depressed agriculturist is looking out for some means of rectifying matters. Some are looking to Canada and the breeding grounds of the Far West for cheap stores, but, much as we wish well to our fellow subjects across the water, for more reasons than one we do not believe that an extension of the foreign live cattle trade is desirable. We have without ourselves room to breed and rear an endless supply of cattle if we can only take the trouble to do it, while there was never a greater pecuniary inducement to do so than at the present moment. It may of course be taken for granted that there are many individual farmers who could not rear at a profit. The dairyman who can realise from 8d. to 1s. per gallon for his milk would, of course, be wrong to apply it to feeding calves, as it would not realise more than half that money in this line; but where milk is cheap, or the bye-products can be easily had, there should always be a lot of youngsters coming up. The Rev. John Gillespie, a well-known Scottish authority on live stock, has focussed the experience and opinions of some of the leading calf-rearers of the United Kingdom in an article in the Highland Society's *Transactions*, and as his correspondents include such well-known names as

John Treadwell, Gilbert Murray, and Garrett Taylor, it is worth the trouble of collating their evidence and taking notice of what they have to teach us. All of them, of course, use various mixtures of meals after the first day or two, but it is noteworthy that twelve out of thirteen feeders use linseed-cake meal or linseed-meal as one of the ingredients in various proportions. Among the other ingredients of the concentrated food we find peas, oats, wheat, and barley, predominating. Some allow their calves to suck the cows for the first few days, but there is a notable difference between the amounts of new milk allowed in hand feeding. This varies from 3 lb. per head daily to 15 lb. The Messrs. Wright, of Ballantrae, N. B., allow only 3 lb. for the first few days, gradually increasing to 8 lb.—the maximum—in three weeks, when some concentrated food is added. This small quantity is very nearly approached by successful feeders in Forfarshire, who begin with 5½ lb of milk only.

Mr. Treadwell allows 12½ lb. of skimmed milk daily, and Mr. Evershed mentions 15 lb of new milk for the first six weeks as being common in Surrey and Sussex. Even after making allowances for the difference of breeds, there is a wide difference between the quantities of liquid nourishment thought necessary by different authorities. One gentleman—Mr. Henry Ruck, of Eisey, Wilts—dispenses almost altogether with milk. He makes up a mixture of 7 lb. of linseed cake ground fine, 2 gallons of hay tea, 7 lb. of mixed meal, consisting of equal parts of wheat, barley, oat, and bone meal, and 4 gallons of hot water. One gallon of this mixture is given daily at twice, mixed with its own bulk of water, and on this gruel, and this alone, the calves thrive well, and are weaned at three months old. During the first fortnight, of course, they get milk, but are gradually put on to the mixture, which costs from 1s. 3d. to 1s. 6d. per head per week. It strikes us that this system is worthy of very much wider application, more especially when milk is scarce or dear. The only thing is that the master must do the feeding himself, because few hired servants could be trusted to feed carefully enough, or make up the mixture properly, except under close supervision, but if the system is as successful as reported there appears to be no limit to the number of calves which might be reared on a limited number of cows. Indeed, Mr. Powell, Middle Branton, Newcastle, rears thirty calves on the milk of four cows only with the help of solid food.

Eighty degrees Fahrenheit is recommended as the proper temperature for the foods by Mr. G. Murray, and the value of separated milk is shown in the reports of several farmers. The importance of a suitable calf-house is not lost sight of, it being impossible to rear strong healthy animals in dark, ill-drained, ill-ventilated structures, the mere surroundings of the young animal being often sufficient to cause injury apart from the feeding.

X. Y.

The name of the late Mr. Jonas Webb of Babraham was well known as a king among breeders throughout the world. What Collings was to the Short-Horns, McCombie to polled stock, or Bakewell to Leicester sheep, that Mr. Webb was to the South-Downs; and at his sale about thirty years since, a thousand head of sheep ran to an average of close on \$60 each. But this was outdone at his son's (Mr. Henry Webb) sale last week, where 247 ewes and yearling rams made an average of \$78.75 each. Dukes and English nobles were to the front galore, while untitled buyers, and representatives from America, France and the English colonies, helped to swell the enormous total. None of the flock or of its predecessors had been exhibited to the showyard during the generation that had passed between the two sales, so that it was their actual merit and high character that gained this position for them.

London, July 30.

NON-OFFICIAL PART.

Sudden Change.

Mrs. George Flewelling, St. John, N. B. writes :—" I suffered from weakness and costiveness, so I bought a bottle of Burdock Blood Bitters, and before I finished it, noticed a change. After using three bottles I am now entirely cured, and recommend B. B. B. as a positive cure for costiveness."

THE "HARAS NATIONAL" COMPANY

40 Acclimated Normans and Percherons Stallions.

Most favorable terms, a small amount only asked for in cash. Stalls at Outremont, Offices : 30 St. James St., near Montreal, Montréal. I.S. BEAUBIEN, President. R. AUZIAS TURENNE, Director.

Well Pleased.

DEAR SIRs,—I can recommend Haggard's Yellow Oil as a sure cure for rheumatism. I had it for some time and was cured by two bottles, and I must say it is the best thing I can get for general use as pain reliever.

J. MUSTARD, Strathavon, Ont.

TO THE DEAF

A person cured of Deafness and noises in the head of 23 year's standing by a Simple Remedy, will send a description of it FREE to any person who applies to NICHOLSON, 177, MacDougal Street, New York.

If You have a cough.

Do not neglect it. It should be loosened as soon as possible, and to do this nothing excels Haggard's Pectoral Balsam. Obstinate coughs yield at once to its expectorant, soothing and healing properties, while colds, hoarseness, whooping cough, asthma, &c. are promptly relieved by its perfect action on the throat and bronchial tubes.

ADVICE TO MOTHERS.

Mrs WINSLOW'S SOOTHING SYRUP, for children feeding, is the prescription of one of the best female nurses and physicians in the United States, and has been used for forty years, with never failing success by millions of mothers for their children. During the process of teething its value is incalculable. It relieves the child from pain, cure dysentery and diarrhoea, griping in the bowels, and wind-colic. By giving health to the child it rests the mother. Price 25c. a bottle.

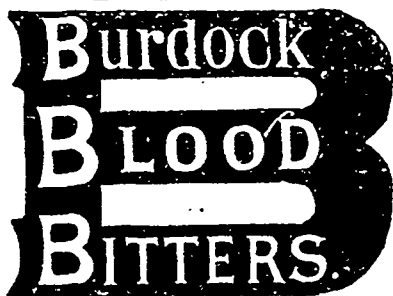
THE KEY TO HEALTH.



Unlocks all the clogged avenues of the Bowels, Kidneys and Liver, carrying off gradually without weakening the system, all the impurities and foul humors of the secretions; at the same time Correcting Acidity of the Stomach, curing Biliousness, Dyspepsia, Headaches, Dizziness, Heartburn, Constipation, Dryness of the Skin, Dropsy, Dimness of Vision, Jaundice, Salt Rheum, Erysipelas, Scrofula, Fluttering of the Heart, Nervousness, and General Debility; all these and many other similar Complaints yield to the happy influence of BURDOCK BLOOD BITTERS.

For Sale by all Dealers.

T. MILBURN & CO., Proprietors, Toronto.



WILL CURE OR RELIEVE

- BILIOUSNESS, DIZZINESS,
- DYSPEPSIA, DROPSY,
- INDIGESTION, FLUTTERING
- JAUNDICE, OF THE HEART,
- ERYSIPELAS, ACIDITY OF
- SALT RHEUM, THE STOMACH.
- HEARTBURN, DRYNESS
- HEADACHE, OF THE SKIN,

And every species of disease arising from disordered LIVER, KIDNEY, STOMACH, BOWELS OR BLOOD.

T. MILBURN & CO., Proprietors, TORONTO.

ESTABLISHED 1859

HENRY R. GRAY,

Chemist and Druggist,

122 St. Lawrence Main St., Montreal.

Country physicians, Hospitals, Convents, Colleges, and Veterinary Surgeons supplied with pure drugs and chemicals at Wholesale prices.

Agent for French, English and American Specialties and patent medicines.

N. B.—Owing to the widening of the street I have removed from my old stand No. 144 to No. 122 St. Lawrence Main St. Corner of Lagachebière.

GRAPE NIAGARA VINES

Also other SMALL FRUITS. New Descriptive Catalogue Free. T. S. HUBBARD CO., FREDONIA, N. Y.

ROOFING

GUM-ELASTIC ROOFING FELT costs only \$2.00 per 100 square feet. Makes a good roof for years, and anyone can put it on. Send stamp for sample and full particulars.

GUM ELASTIC ROOFING Co., 39 & 41 WEST BROADWAY, NEW YORK.

Local Agents Wanted.

TO THE

AGRICULTURAL SOCIETIES

AND TO THE

PUBLIC GENERALLY

The Editors and Publishers of the Journal of Agriculture perform every kind of printing and binding, also wood engraving at most moderate terms.

E. SENÉCAL & FILS,

20 St. Vincent St., Montreal.