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Report of the Committee on the Fruit-growers Associations.

Montreal, June 10th, 1882.

To the President and Members of the Council of Agriculture:

It is with sentiments of the liveliest satisfaction that the members of this committee desire to draw the attention of the Council of Agriculture to an excellent report on the fruits of Russia, lately published by Mr Charles Gibb, one of the most active members of the Montreal Horticultural Society, a copy of which has been forwarded to every member of this Council.

The Horticultural Society of Montreal, established in 1847, was one of the societies placed under the control of the Council up to 1878, at which time it became an independent Horticultural Society, with an annual grant of $1,000.00. All who have followed, step by step, its progress will admit, with us, that it has conferred incalculable benefits on the country, by spreading abroad a taste for the cultivation of fruit-trees. Its annual exhibitions have always been visited with the liveliest interest, and an intelligent public has not failed to remark that, as regards the excellence and variety of its fruits, the Province of Quebec has little left to be desired. Our climate, our soil, and our system of cultivation, have indisputably proved that, in spite of our short summers and our long and rigorous winters, we can produce fruits, which in regard to their excellence are worthy rivals of fruits grown in countries more highly favoured than our own.

You have not forgotten, gentlemen, that the Montreal Horticultural Society has frequently appealed to you to employ the influence of the Council in obtaining from the government a grant in aid of the translation and publication of its reports; reports both interesting and full of practical suggestions, and edited by men who have made a thorough study of the matters in question, among whom stands preminently the distinguished name of Charles Gibb. Your committee acknowledges, with pleasure, that you have never shown yourselves deaf to these appeals to your generosity, and that the government has always made it a duty to second your praiseworthy efforts by granting the just demands of a society which works with so much zeal to promote the best interests of the province.

At a meeting held on the 1st of March 1882, the Council again received a deputation from the Montreal Horticultural Society, which presented a petition shewing the advantages to be derived from the importation of fruit-trees from the colder regions of Russia; insisting on the advisability of their introduction into the province, and of their distribution into all parts of it after their proper acclimatisation. In conclusion, the petition prayed that the government would grant a certain extent of land and a sum of money sufficient to establish an experimental farm, a sort of orchard and nursery, for the purpose of importing, of propagating, and of distributing Russian fruit-trees.

Actuated probably by want of funds, the government, in spite of the recommendation of the Council and of the transmission of the document aforesaid to the proper quarter, took no initiative in this enterprise. Such being the case, Mr Gibb, believing that the time for action had arrived, and that the country was in a condition favourable to the trial of experiments in the importation of Russian fruit-trees, decided to go to Russia at his own expense. There, he was received with the kindest sympathy, and being on the spot, he devoted himself to the study of the fruit-trees in question in their own climate and soil, and thus convinced himself of the possibility of their successful introduction into Canada. The result of this thoroughly conscientious study is the "Report on Russian Fruits, by Mr Chas Gibb." In this pamphlet, Mr Gibb relates the observations and the pomological studies which he made during his travels in Russia; and, with a clearness which nothing but a deep meditation of the subject could give, he describes the apples, the pears, and the plums of the country, pointing out the sorts which, in his opinion, it would answer to import into Canada. This work of Mr Gibb's is doubly interesting—from the knowledge of the subject treated, and the special value it possesses in connection with the wants of this country.

Your committee has been informed that certain enterprising horticulturists, trusting simply to Mr Gibb's recommendation, have already given large orders for the fruit-trees of Russia; and there is no doubt that in a few years we shall have the satisfaction of seeing these fruits sold advantageously in our markets, and, perhaps, after having been improved by cultivation in Canada, they may find their way to the centres of consumption in Europe. Men, whose character for patriotism, devotion to their duty, and perfect disinterestedness is beyond cavil, are rare in all countries; hence, we cannot too much admire the conduct of Mr Gibb in this undertaking; conduct which has been guided by the purest philanthropy, and which has had for its aim the prosperity of his country.

In these circumstances, your committee conceives it to be its duty to request the Council, as a mark of recognition and gratitude, to pass a vote of thanks to Mr Gibb for his eminent services, expressing your appreciation of the noble devotion of such men, who never calculate the amount of personal sacrifices they impose upon themselves when the interests and prosperity of their country are in question. Your committee, in addition, hopes that the Council will, at the same time, humbly pray the government to cause the valuable report of Mr Gibb to be translated into French, and to be distributed among all our agricultural societies.

Were it not for the impoverished state of the Council's finances, your committee would have wished you to accompany this resolution with some more tangible mark of your appreciation of the immense services rendered to the country by Mr Charles Gibb.

But your committee cannot close these remarks without making a suggestion which it submits to your kind consideration.

You have doubtless learnt, through the papers, that the government has established a farm-school at Rougemont, on the property of Mr George Whitfield, with an annual grant of $6,000. Without desiring to interfere with the management of this new school, which, besides, is perfectly independent of the Council, your committee believes that the government would with pleasure accept the suggestion of the Council, that a certain sufficient part of the Whitfield farm should be placed at the disposition of the Montreal Horticultural Society, for the cultivation, acclimatisation, and propagation of the fruits of Russia and other countries, and their subsequent distribution over all parts of The Dominion.

We have already five County Horticultural Societies, which, in great part, owe their existence and their success to the excellent practical suggestions of Mr Gibb. These associations work with ardour to spread abroad a taste for this kind of cultivation, and they have all obtained results which exceed their most legitimate hopes. These associations would be the first to benefit, more directly, by the happy results thus obtained, and before long, would reap the immense advantage of adding to their list—already a pretty long one—many an excellent sort of fruit, and a great variety of new species, the rapid sale of which cannot but increase our national resources.

Your committee has the honour to submit these suggestions to the Council. They are dictated, solely, by its admiration for the disinterested devotion of Mr Gibb, and by the conviction that the Council will feel it to be its duty to second, as far as its power goes, the generous efforts of a citizen *who has well deserved of his country.*

The whole humbly submitted,

J. M. BROWNING, president.

From the French.

I have just received the Prize-list of the Industrial Exhibition Association of Toronto. As far as I can see, there are prizes for every thing in nature and in art, from a pumpkin to a *Lady Rider*. I wish some one would follow suit in Montreal, in the prize for "*class* 13.—*For tandems.* For best tandem of horses and turn out (*upset?*), style and skill in handling, &c." The &c., I presume, refers to the management of the whip. This is evidently a lost art in Montreal. I was amused the other day at seeing a "swell dragsman" mounting his box, and after four fruitless attempts to catch up his whip *back handed*, reluctantly resort to the process of winding the thong round the crop by a series of convolutions beginning at the handle. One twist of the wrist does it, and the art can be learnt in five minutes. Most of our tandem men let the leader do too much work. The long traces should *never* be tight except at a heavy piece of road or up hill, and the same thing holds good with the four-in-hand. A. R. J. F.

POINTS OF CATTLE—PROF. BROWN.

A most sensible statement—thorough common sense. Mr Brown is evidently no more a believer in the escutcheon theory than I am.

IN THE BULL—Favour masculine character without coarseness; consider size and weight according to age; a good carriage is invariably an indication of vigour and breeding. A bull should show all the beefing qualities desirable in his offspring with grades,—we are too apt to overlook this in criticising high feeding; discourage a wedgy muzzle and narrow nostrils; test the ear, as well as other parts, for indications of quality. Curly hair, irrespective of breed, is good evidence of constitution. Colour of hair is nothing particularly, except for Herefords, Aberdeen polls, Galloways and Devons. A very uniform or evenly balanced animal, without any prominent points, often wants in character, according to his kind. Never neglect pedigree.

IN THE COW—Secure the forequarters of a milker, according to breed. The colour of the skin is a good guide seldom used, and as a whole is more reliable than the escutcheon, among beefing breeds. Width and depth of hind-quarters must be got in all classes. It is more difficult to judge cows than bulls.

Maine Inspection of Fertilizers.

We are indebted to Secretary Gilbert of the Maine board of agriculture for a copy of the report of the inspector of fertilizers in that state. Notwithstanding the adoption by the inspector of the absurd and misleading standard of prices set up by the Massachusetts, Connecticut and New Jersey inspectors for the main ingredients in fertilizers, hardly any of the fertilizers reported upon show a "value" equal to cost. Some of them are ten and even eighteen dollars in value per ton less than the estimate which persists in making phosphoric acid in a "soluble" phosphate worth twice as much as in raw bone. This we call absurd, for there is every reason to believe that the advantage, agriculturally considered, is with the raw bone, especially when it has been packed with ashes and moistened, as we have frequently advised. Yet the acid or soluble phosphate is reckoned twelve and one-half cents per pound for its phosphoric acid, while only six cents is allowed for the phosphoric acid of ground bone. At this rate every farmer ought to know which to buy, and if farmers generally did know, and would buy the bone in preference to such high priced fertilizers, the price of the latter would soon come down somewhat nearer to its true value. Ground bone, if pure, has from twenty to twenty-eight per cent of phosphoric acid and from two to four per cent of nitrogen. When ashes is added in the proportion of two to one, we have a fertilizer containing about eight per cent of phosphoric acid, one to two per cent of nitrogen and ten per cent of potash, which is just about right for all root crops except onions and all grain crops except wheat, both of which want about four per cent of nitrogen. This mixture at $40 a ton for bone and twenty five cents a bushel for ashes costs as follows:

One ton of bone (25 bushels).....	$40.00
Fifty bushels unleached ashes (3,000 pounds)..	12.50
Cost of two and one-half tons.....	$62.50

or $25 a ton, while phosphates in the market containing no more phosphoric acid or nitrogen, and less than two per cent of potash, are sold for from thirty-five to forty-five dollars a ton. We consider all estimates of value, based upon the tables used as mentioned above, to be about twenty-five per

cent too high, yet figured at these rates, the Bowker fertilizers fall sho.. nearly ten, while even the Bradley fertilizers and the Soluble Pacific Guano fail to come up to this depreciated standard, the Bradley reaching only to $41.30 and the Pacific $39.66. If we take twenty-five per cent from these figures, we have the Bradley down to $31, and the Pacific to $39.75, which is about their real agricultural value, and all a close-figuring farmer will find himself able to make a reasonable profit on. *Vermont Watchman.*

There is very little difference of opinion among *practical* men as to the relative values of phosphoric acid in a soluble and insoluble state, provided always that the crystalline form of phosphate of lime (apatite) be excluded altogether: apatite, as I have often shown, is useless unless dissolved. For top-dressing grain-crops, for forcing the young turnips out of the way of the fly, common sense would advise the use of a rapidly available manure—superphosphate: in all other cases, finely ground bones, coprolites, or the other softer forms of mineral phosphates, will answer all purposes.

I am happy to see that Dr Hoskins, in the above article on fertilizers, shares my opinion as to the propriety of treating raw bones with moistened ashes. In this case, it wil not be found necessary to grind the bones very fine, as the heat developed will moulder them down into a much more comminuted state than any mechanical means can do; the larger the heap the more powerful the action, and a slight covering of earth, mixed, if you will, with plaster, will aid in retaining any ammonia that may be evolved. In clays, where potash is not often required, common soil may take the place of the ashes. In this Province of Quebec, until the price of artificial manures is lowered considerably, it is vain to look for their general employment. A. R. J. F.

Guelph Agricultural College Sale.

Readers of the Journal will see in our advertising columns a list of animals to be disposed of by auction at the Ontario Agricultural College. Sixty cattle, 200 sheep, 20 swine, and 10 Scotch collies, will be offered to the public without reserve. It would a waste of space to expatiate on the quality of stock exposed at this now justly celebrated establishment. The Aberdeen Polls and the Southdown sheep are alone worth a journey of a few hundred miles to see. A. R. J. F.

Monthy report of The Provincial Model-Farm, Rougemont.

NOXON'S GRAIN-DRILLS.—However skilfully grain may be sown with the hand, it is very certain that broadcast sowing can never equal in regularity of depth &c. the work of a good drill.

Noxon's drill, which can be regulated at will, sows any desired quantity of seed per acre with the utmost nicety. A harrow is attached to it, which covers all the seed with a regular depth of mould. The grain falling between the horse and the harrow is not trodden into the ground, and consequently there is no hindrance to the immediate and equal "brairding" of the seed. The teeeth of the harrow are movable but attached to the frame by a strong spring, so that on meeting with a stone or clod, they bend and escape being broken. A dial in the seed-box regulates the quantity of grain sown per acre, and shows, too, how much grain has passed through the drill.

MANURES.—The following is a statement of the value of solid and liqnid manures in London, England:

1000 lbs.	Cow-dung-fresh			.....	$0.66
"	"	Horse	"	"	..... 1.00
"	"	Sheep	"	"	..... 1.54
"	"	Hog	"	"	..... 1.14

Urine compared with mineral manures, per 1000 lbs.—cow's, 6 9; horse, 9. 6; sheep, 11. 8; hog, 26.--(1)

MILK.—That cows at grass give much more milk than cows kept in doors, is well known; but the milk of the latter is much richer—even half as much again more valuable. Cows yield in proportion to the food they receive. Cleanliness and good and abundant food are indispensable to their proper treatment; and in milking the greatest care should be taken that the hands are clean, and that no dirt be allowed to fall into the pail; milk is very *sensitive*, and readily absorbs any bad odour or *taste*.

BUTTER-MAKING.—(*Notes by Mr Jocelyn*)—At all places and at every season, there is a difference in the price of butter. While we see butter sold on the market for 25 cts a pound, we see on the same market other qualities fetching the absurdly low price of 10 cts., and in fact unsalable for its proper use, that is, as an article of food. At New York, last spring, butter six months old and upwards brought only 10 cts., and at the same time and place, butter made at the same date was fetching 25 cts. Nothing more is needed to prove the immense advantage to be derived from making no other quality of butter than the very best. If a dairyman can make butter and sell it without a loss at 10 cts a pound—an impossible thing, by the bye—the inferiority of his article would, nevertheless, cause him to suffer a gross loss of 15 cts. It is just as easy to make good butter as to make bad. The work, the carriage, the commission, are the same in both cases. All that is necessary is care and attention. A farmer who brings first-rate goods to market can always sell them to advantage, and will get from 25 cts to 30 cts for his butter; that is to say, a good article always fetches its price, while a bad article has to be given away.

Butter is made either with sweet or with sour cream. There is a great difference of opinion among the best makers as to which is the better plan. It is very certain that butter made with sour cream preserves its grain better, since it is more difficult to injure the grain, and this for two reasons: 1st the acidity developed by the cream in souring hardens the grain; and, 2nd, in the sweet cream there is a certain quantity of volatile aromatic oils, derived from the grasses with which the cows are fed. The acidity destroys these oils, and when they have escaped, the cream thickens and becomes butter more quickly. Nevertheless, good butter *is* made with sour cream, but if it is treated in the same way as sweet cream, the butter will prove a failure. In Denmark, where dairy-work is carried to perfection, butter for exportation to hot climates is made with sweet cream, and keeps very well.

As we have seen, the destruction of the volatile oils of the cream by acidity causes the more rapid conversion of the cream into butter. Consequently, sweet-cream-butter is more subject to deterioration. Still, the butter is more delicate in flavour, on account of the presence of the aromatic oils.

In the churning of sour cream, gas is set free, and if it does not escape, the butter won't *come*: there must be air. With sweet cream, on the contrary, the air must be excluded. In certain creameries in the State of New York, butter is still made, in winter, in the old fashioned churn--like a tub, larger below than above—they have only one beater, which strikes the cream from top to bottom and from bottom to top, thus allowing the gas to escape through the hole through which the beater (agitator) passes. The gas escapes, and the butter *comes*. The fault in these churns is, that the cream is not churned equally. Equal and continuous churning is absolutely necessary to the production of good butter. Churned in this way, the butter is formed in grains so fine

(1) I confess I am quite at sea with these figures. A. R. J. F.

that they are hardly visible to the naked eye. As soon as the butter is separated from the milk, the churning should be stopped, the desired result is gained, and the complete separation of the butter-milk can be secured by pouring a pail of cold water into the churn—the grains of butter will float, and can easily be removed by a skimmer reserved expressly for that purpose—the butter should not be touched with the hand.

For *washing the butter*, the water must be clean and cold, not hotter than 50° F., lest the butter should lump together (*se prendrait en pain*). For every hundred pounds of butter, two hundred and fifty pounds of water, in which salt at the rate of one pound to fifty pounds of water has been dissolved, will be necessary.

If we use the hand in making up butter, the Danish plan should be followed. One thing is certain: no instrument can replace the human hand, whatever people may say. The hand regulates the pressure according to the will, but its animal heat must not be communicated to the butter; for if it be, the grains would melt, and the product would acquire a bad taste We must, then, like the Danes, dip the hands into very hot water, and immediately into iced water, and then the butter can be worked without fear of damage. As soon as the hand becomes warm, the same process must be repeated. It is clear that no one could keep on long at this system without contracting serious injury to his health.

In working up butter with the *lever*, care must be taken not to allow the slightest degree of friction: the pressure of the instrument should be so managed that the butter-milk may be expelled without any *drawing action* of the lever. The thickness of the layer of the butter to be worked on the table should not exceed two inches. In vol. V of the *Journal d'agriculture*, p. 83, an excellent plan for salting butter without using the hand will be found.

The quantity of salt used depends chiefly upon the market where the butter is to be offered for sale. The buyers may like it salted, but this should not lead us to over-do it. Generally speaking, butter receives enough salt to expel the remaining butter-milk, and the butter, thus treated, will keep, the most advisable quantity to use is one pound of salt to twenty pounds of butter.

The salt must be well mixed with the butter, and must be very dry. Kept in a moist place, salt will imbibe one fourth of its weight of water. The manufacturers do not all send out salt of the best quality, it should be pure and no foreign matters should be found in it. Higgin's "Heureka" salt, made after a new plan, is highly spoken of. Butter is sufficiently salted when, on pressing it gently, the pickle exudes in tiny drops.

Ten hours after salting, at most, the butter should be worked over again. This is done to expel the excess of the pickle, and to make the butter uniform in texture. Here, we can judge if the first operations have been properly conducted. White stripes in the butter are infallible proofs that the work was not well done: the striped part will be found salt enough, and perhaps too salt. It is not the white *spots*, but the *stripes* to which attention is directed; the spots arise from water having got mixed with the salt. In both cases, the butter must be worked over again, eight hours after the salting, and even then it is difficult, almost, perhaps, impossible, to make it a first rate article.

The absence of these stripes and spots is an evident proof that the first working was well done. The first and second workings are quite distinct operations. In both, the slightest degree of friction, as well as any over-working, must be avoided. If, after the second operation, you cut the butter on the table, or divide it with the butter-slice, it will be found uniform in all parts, and resemble *in fracture* a piece of cast iron. If, on the contrary, the work has been badly done, the butter will be found, instead of having a uniform and solid grain, to be dull, and the grain *waxy* or like *salve*. Too much worked, the butter, instead of the *cast-iron fracture*, will have a dull, elongated grain, and must be sold at once for what it will fetch—only loss can ensue from keeping it. All the advantages gained by the first working are lost by overdoing it in the second.

PACKING BUTTER.—Butter-tubs are generally made of wood. Here, however (*at the Model-Farm, I presume. A. R. J. F.*), we pack the butter in tin cans, as the West Indian market will have it so, and all our butter is made for exportation to Barbadoes. Salt injures the tin, and thereby imparts a certain flavour to the butter which depreciates its value.

In the United States, *white oak* is preferred to any other wood. Still, precaution is necessary in its employment, lest it colour the butter. It should be soaked in very strong boiling pickle for two or three days; i. e. the tubs should be filled with the pickle and allowed to soak for that time, by which means, the pickle will insinuate itself into the pores of the wood, and drive out anything injurious to the butter. This should be the treatment of all vessels intended to hold butter, and should be done at the very moment before they are wanted for use. In Denmark, butter-tubs are made of *beech*, but our beech would not answer the purpose, as it contains an acid which would certainly injure the butter.

In Canada, we have three sorts of wood fit for making barrels or tubs: fir, white ash, and spruce. All these must be treated with the pickle as above, and then washed and rinsed with clean water, as cold as possible. It is of the greatest importance that the butter be pressed so firmly into the bottom of the tub that no air can remain. It is easy to see that wherever air remains the butter will be spoiled. A pestle, four or five inches in diameter, is generally used for this purpose. The layers of butter should not contain more than four or five pounds, and all friction should be avoided in pressing. The barrel-shaped is the best form of vessel; inside, are placed laths (*triangles*) to prevent the butter from going more to one side than to the other, and the barrel can be hermetically sealed. This kind of vessel would be infinitely preferable for exportation to the Indies, only the heat of the climate would melt the butter.

The vessel having been filled to within half an inch of the edge, a white cloth, perfectly clean, is placed in it, and a pound of salt is added.

It is of the greatest importance that both the inside and the outside of the tub be perfectly clean, and the whole, taking to the eye. Birch bark placed on the butter causes a loss of $1 a tub in Montreal, though in Quebec they don't care about it. Finally, butter made in the manner described, and kept in cool cellars, well ventilated, and the doors of which only open to the North, will keep in good condition for two years, and there can be no fear of a fall in prices.

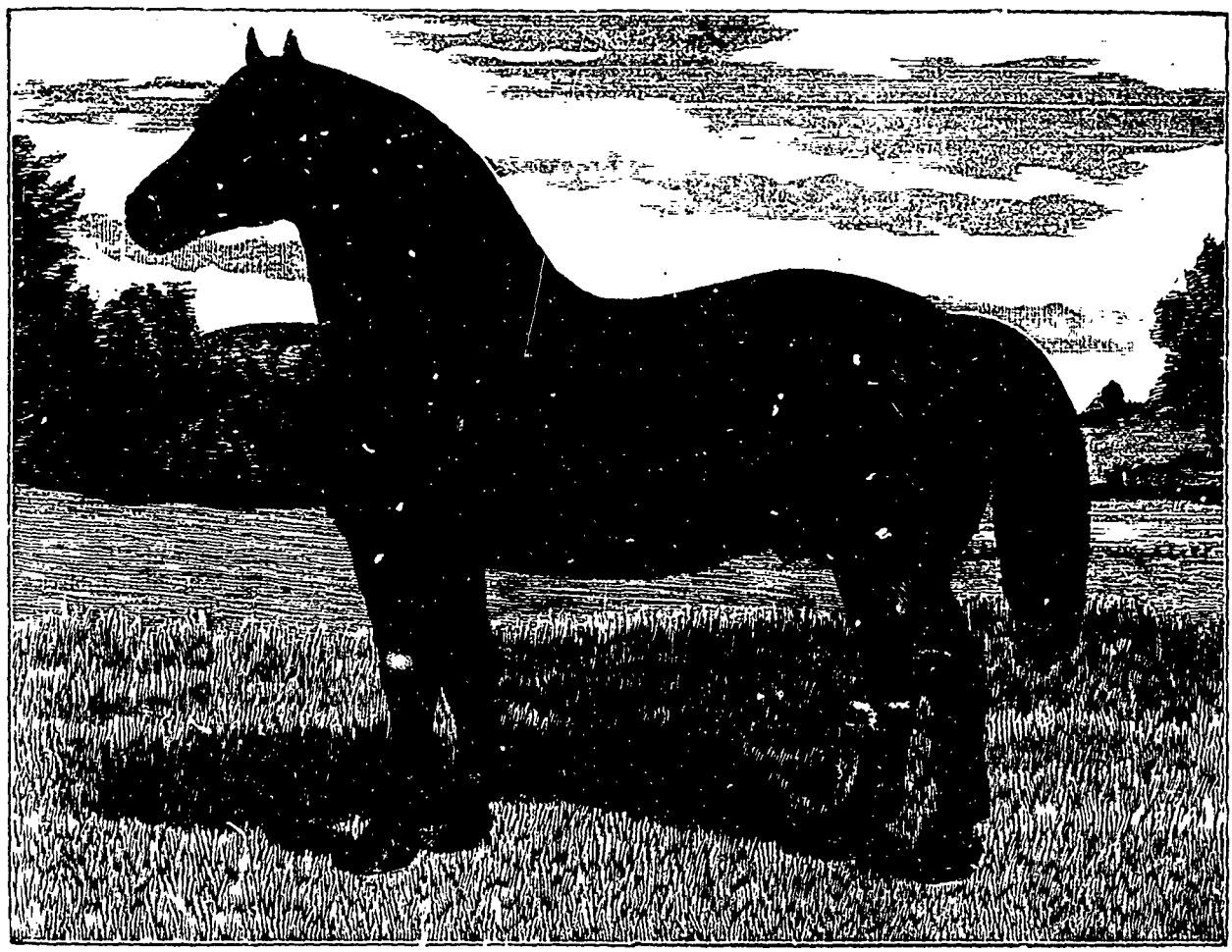
HAY—OX-EYED DAISIES.—The ox-eyed daisy has taken possession of the greater part of the meadows and pastures of the country. If a daisy-stalk is pulled out, never mind how carefully, almost all the roots will remain in the ground, and will, of a certainty, sprout again. It is, therefore, useless to attempt to destroy these daisies by hoeing up the bunches of them in the meadows. All that one can do in this way is to prevent the seed ripening, and the plants from extending themselves—both pretty important points. The chief remedy for daisies, as well as for all other weeds, consists in stubble-paring or grubbing after harvest, and, in the spring, in ploughing, harrowing and scarifying. All these operations should be performed in dry weather and in the full splendour of sunshine, and should be repeated from

time to time until all the roots are destroyed. If the spring be favourable, there will be time to sow some green forage-crop, or buckwheat, on the fallow by the end of July. Any farmer who treats a small piece of land in this way, will end by cleaning his whole farm, and he will find that the exceptional treatment which his land has undergone will, as far as the expenses go, be amply paid for by the additional crops. This invasion of the daisy has been caused principally by the sowing of seed clover and timothy brought from abroad. On examination of the foreign seed with a microscope, it will be seen what a mixture it is. The best plan would be for the farmers, each to grow his own grass-seeds, choosing for that purpose the best and cleanest part of the crop. Agricultural societies cannot too much encourage the production of the best grass seeds. This would be far better than to distribute foreign seed of whose quality we know nothing.

IMPROVED MOWERS.—It is in a year like this, when hay is abundant and full of clover, that the importance of good mowing machines is seen. Besides, a good one does not cost more than a bad one. A farmer who is about buying a mower ought to try it first on a piece of clover that is thick and laid. And again, a guarantee ought to be demanded as to the time the machine is to last; for it happens sometimes that a new mower works well for a certain time, and then, from some imperfection in its construction, wears out and tumbles to pieces before it has done half the work one has a right to expect from it.

To cut heavy laid crops of hay and clover in a satisfactory manner, the mechanism of the mowing machine should permit of the teeth and knives being inclined towards the ground; thus allowing the grass to be cut very low, and lifting up the crop instead of pressing it still more down. Only these sorts of mowers ought to be bought for the future.

HAY-TEDDERS. In a wet, catching time like the present, the use of these implements is clearly seen. Our hay-tedders have not as yet attracted the attention their merits deserve. With a tedder, the farmer can turn over and shake about, from nine o'clock in the morning, the hay cut the night before, and the tedder being one-half wider than the mower, will do one-half more work, so that by one p. m., all the hay cut the day before will have been turned and shaken out, and can be raked together and put into cock at once. Hay thus treated can be carried much quicker and in better order than usual. If the farmer has covers of unbleached calico for his hay-cocks, in addition to mowers, tedders, and rakes, he is in the best position to get his hay safe in barn or stack in the shortest possible time, and at the least possible expense. The cocks made in this fashion may be carried without being previously opened out. The hay will cost less to make, and be of better quality, none of its nutritive matters having been



PERCHERON-NORMAN STALLION.

wasted. Four yards of calico, at about six cents a yard, will suffice for one cover. The corners are stitched and sewn into the form of a sack, and a moderate-sized stone in each corner retains the cover in its place.

TWO HORSE CARTS AND WAGONS.—Authorities differ as to the advantages of one- and two-horse carriages for carting hay. The former are more difficult to load, but if they are long and well made, a good horse will easily draw more than one-half of a double load. The loader, however, to ensure this must understand his business. Again, the one horse cart is easier to drive, and turns in less space. On the other hand, it is more easily upset, and each horse wants a separate driver. This last objection does not amount to much, as two drivers can easily help each other in driving their respective vehicles. I have arranged a double carriage, a very simple one, with which I am quite satisfied. Having a hay-rack fitted to a sleigh, I made use of it for my summer work. The winter rack is fastened to an axle and a pair of wheels, in summer, for the fore part. A piece of hard wood four inches, by eight inches, crosses the rack below, in its full length and protrudes about three feet and a half in front.

The rack is then supported, below the axles, about sixteen inches from the ground, by good iron-work. As the rack is five feet wide, *the hinder axle is long in proportion*, and its wheels do not run in the ordinary track; but as my wheels are three inches wide, I see no objection to this, and the front wheels run in the usual track. These turn very easily at right-angles, being only restrained by the wooden bar, six inches by eight inches mentioned above. Side-ladders keep up the hay alongside of the hind wheels. The vehicle being five feet by thirteen feet will carry a good wide load, and as the whole is very near the ground, it is easily loaded, even during a gale of wind. A carriage of this description may be advantageously used for all kinds of heavy work. Thus, in carrying off stones, it is as handy as the usual *stone boat;* and in it, the same team will take six times as heavy a load, in summer, as they can in the stone-boat. In winter, the same rack placed on a couple of *bob-sleighs*, forms a double carriage; a very useful machine for dung-carting, very easily loaded and unloaded. An ordinary board placed on each side of the rack enables more dung to be loaded on the carriage than two good horses can draw.

HORSE-FORKS.—Another great addition to our means of carrying hay is the horse-fork. With this implement, a man and a horse can unload a ton of hay in five minutes. The best horse-fork made is one that has two arms, which open and shut at will. It will answer equally well for hay or grain, and from four hundred pounds to five hundred pounds can be carried up in each forkful by means of a single pulley. The fork is sometimes hung above the middle of the bay, but it is better to make use of the *hay-carrier*.

When the forkful reaches the spot where the hay is to be deposited, the unloader has only to pull gently at a rope which he holds in his hands; the hay will immediately leave the fork, and falling, bury itself in the bay. To make the most profitable use of the horse fork, a good space should be left between the ridge of the barn and the ties of the rafters.

TIME TO CUT HAY.—Clover should be mown when the first flowers are in bloom At that time, it is rare to find clover laid. It is true that, cut so young, clover is not easy to dry. but put into small cocks, of about twenty pounds of dry hay each, as soon as it has been a few hours exposed to the sun, it will finish curing in the shade, all the leaves will adhere to the stems, and, especially if the cocks be covered with calico as above, the hay will be of excellent quality. It is reckoned that seven pounds of well made clover are worth as much for cattle-food as ten pounds of timothy.

Farmers, who manure their young clovers in a proper manner (thirty loads of rotten dung are sufficient for an arpent), may reckon on two cuts a year, or five hundred bundles.

As to timothy, the general opinion is that the value of it increases as it reaches maturity. But the question is far from settled, and ought to decided by a great number of experiments, made with the greatest care, and weighing both the animals and the hay with which the trials are conducted.

In our province, unfortunately, we have no artificial meadows save those of clover and timothy. Lucerne, so valued in Europe, has not as yet been proved profitable here. It would be very beneficial to the country at large if carefully managed sowings of different grasses were made at the model-farm, choosing, of course, those that are likely to suit the climate. Several varieties of foreign seeds have been bought this year, but circumstances have prevented us from beginning experiments with them. (1)

From the French.

OUR ENGRAVINGS.

Imported Percheron-Norman Stallion. Small-Yorkshire Swine.

On the Draught of Single Cart-Horses.

By Thomas John Lloyd Baker.

It is about twenty-five years since I began farming. I started with two things in which I differed from my neighbours; and, I think, I succeeded in both. I am glad to see that they are now under the consideration of the English Agricultural Society. I mean the introduction into general use of lighter and more active farm-horses, and of single-horse carts instead of waggons or heavy carts. I shall show that these are connected.

The horses generally used in the county of Gloucester are either all bad varieties of the old Lincolnshire blacks, or *those of any other sort that can do nothing else. The former* are the most common: they are heavy, slow, loose-jointed animals, whose weight, without a load, is nearly as much as they are equal to. They generally plough about half an acre in a day; and with this most of our farmers are satisfied, because their neighbours do no more.

About the year 1827 I determined to try if I could not have a breed with more activity, with little or no diminution of strength. I considered the merits of our best sorts, and I fixed on the Cleveland, because I thought that, from its nearer resemblance to thorough-bred horses, if a mare of this breed was put to a thorough-bred horse by any man who happened not to want to breed a cart-horse, the colt would sell to a London dealer, at five years old, as a carriage-horses (or possibly even as a hunter), for more money than a cross of any other breed, that would answer well for farm-work, could be expected to fetch. A Yorkshire friend purchased for me a Cleveland stallion, and I bought a few Gloucestershire cart-mares, as clean in the leg as I could get them. I sent my horse to a few towns in my neighbourhood on market-days, but the farmers did not like him; I lost money by doing so, so I put him to my own mares, and worked him on my farm, where he now is. I have no farm-horse, except two mares, which I believe to be thorough-bred Clevelands, that is not descended from him, and I confess I am rather proud of my teams.

My teams are chiefly composed of horses got by this stallion out of the clean-legged Gloucestershire mares which I men-

(1) It will, I hope, be observed that these are *notes*, and therefore the *phrases* are rather jerky. Trans.

tioned above. Still desirous of introducing the breed if I could, I showed, at our cattle-show in November, 1838, my best mare and a foal of her's by my horse above mentioned, as extra stock. Some thought them good, but denied that they were *cart-horses*. At our cattle-show in November last I exhibited in the yard one of my teams (my best of course), two abreast, in a waggon with six-inch wheels, which had been loaded with dung for the purpose. It weighed six tons one hundred and a half. They had drawn it along the road at their usual rate of going, which had been ascertained to be three miles an hour. In the yard two horses were taken off, and the other two, in double shafts, drew it, backed it, and turned it, several times, and at last they drew it on a level Macadamised road for a short distance (20 or 30 yards) with one of the wheels dragged.

I do not mean to say that there are not many pairs that would have done all this; I am sure there are: but I contend that horses that can do it are fit for all farm purposes; and that being so, the greater activity which I have stated of going three miles an hour on the road, which few or none of the heavy horses, as I believe, can do without hurting themselves, and also the better pace at which they go in ploughing, gives them a decided superiority over the others. Add to this the advantage which I shall come to of trotting in the carts. There is no more difficulty, expense, or trouble, in breeding-rearing, or feeding them, than there is with the others; of course, with both, a colt fed well and kept warm will do better than one that is half-starved; but if a man chooses to starve his colts, I really believe that these will rough it as well as the others.

Now for carts.—My land is a stiff clay; my carts are on six-inch wheels, and made to hold half the quantity that my neighbours carry in theirs. My land is hilly: my carts generally go with one horse, but up hill, when loaded, another is put on before, which comes down the hill with the next returning cart. Thus, on level ground, with two carts and two, or perhaps with three, horses, I take out the same quantity of dung that my neighbours carry in their large carts with never less than three horses, and often with four. All my carts have reins; a boy walks and drives them when loaded, but when returning empty he gets into the cart and trots back at the rate of about five miles an hour; which of course saves about half the time in returning. Here again I have a manifest advantage in using lighter and more active horses.

Some time ago I made the following trial. Two heaps of stone, of 32 tons each, were landed from a barge: they were to be taken to the same place, about a mile and a quarter off. A farmer began the first with two large carts and three horses; one cart was being loaded while the other was moving, and the horses were taken off and put on at every load. Finding that he could not do it in the day, he gave over at the end of about six hours, and set to again the next morning; this rest, of course, giving him an advantage, as you will see, but, anxious for their own credit, both he and his man made the very best use of their time. Their work was completed at eleven loads (which of course is nearly three tons to each load, or one ton to each horse), in nine hours and fifty minutes. I began the other heap with three small one-horse carts, and completed it in one day, at twenty-one loads (being nearly a ton and a half to each horse), in six hours and one minute; which was a saving of about three hours and a quarter on nine hours and fifty minutes, or rather more than one third. In this I had three decided advantages—first, the saving of time by trotting back; secondly, the rest that each of my horses got in his turn while his cart was being loaded; and, thirdly, the ease with which my carts were loaded in consequence of being lower.

NOTE.—Yesterday I finished another trial of the three light carts with one of my half-bred Clevelands in each I wanted to move dung made in my stalls during the last winter to a field, where it was to be put into a heap for use. When finished the new heap measured 204 cubic yards. The distance from one heap to the other was 680 yards. The work was done in 24 hours, being 3 days and a small part of a fourth. This will seem but a small number of hours for each day, but the heaps were 2 miles from the stable, and the horses went and returned each day. They trotted back from the new heap to the old one, and there were hands enough at both to keep them always moving, but nothing was said or done to make them go beyond their usual pace. Of course the dung was nearly rotten, but moist and heavy, and, had the old heap been measured, the number of cubic yards would have been less. The diameter of my cart-wheels is 4 feet 3 inches; the wheels and axletrees are cylindrical; they are 6-inch wheels, but I am not sure, if I was to begin again, that I should recommend exactly that build.

FRUIT.—PRUNING APPLE TREES.

STANDARDS one year planted in a permanent position and well established at the root will be by this time in good condition for their first and most important pruning; for the shoots left now will form the outline of the future tree. Presuming that the trees when planted were the sorts usually sent out from nurseries for orchard planting, viz, trees cut down once after grafting, they will now have heads consisting of five or six strong shoots left entire at planting time, and in addition thereto will be the growth made during the current year; but as this is usually neither strong nor well ripened, most growers cut back to well ripened wood of the preceding season. The branches are thinned out well, leaving such as point outward, and thinning the centre out well, but not so that too many shoots all start from the same point so as to form a cavity for water to lodge in when a large size has been reached. Better leave two or three tiers, each consisting of two or three shoots. From three to five shoots are plenty to leave at the first pruning, and when they break afresh two of the best leading shoots should be selected and the rest pinched in to form spurs. If left until winter and then cut back they give rise to a quantity of useless spray that might have been converted into fruit buds by timely attention, and the leading shoots will make all the more progress, for the stronger these are, and the better ripened by having plenty of light and air playing round them, the longer they can be left at the second winter's pruning. In respect to this, various opinions are held, some allowing the head to grow as it likes after it has been once cut back; others again make it a rule to look over all their trees every winter, shortening the tips of the strong shoots and removing any pieces that may be crowding the centre, the head being kept evenly balanced. I am quite convinced that although good crops of apples can be grown in both ways, yet by the latter plan one gets better shaped trees, and certainly an equal weight of fruit, which, if not so numerous, is certainly of larger size and of higher market value. It is the high coloured apples that realise the best prices, and, therefore, in standard trees, the larger the surface exposed to sunshine, and the less the sap is diverted to inferior branches, the better will be the produce. Moreover, trees whose shoots are topped every year with a sharp knife or the *secateur* never need what the advocates of letting them alone call pruning, *viz*, cutting out several faggots of wood from a large tree, an operation that usually gives it a check from which it does not recover for several years. After the trees get eight or ten years old I find the *averruncator*, or long-handled tree pruner, very useful; for by the aid of a pair

of steps or tressels with steps on each side a man can quickly get over an orchard of young trees without putting the ladder against them at all. It is the shoots that rush upwards that need stopping in order to induce them to branch out into fruitful twigs and spurs. Some apples, that are noted for being nearly all flower buds and making scarcely any wood, can only be kept growing by just taking the tips off the shoots every year. If left unpruned they cease to make any young wood ; and the same remark aplies to some slow growing or tender apples, like the Ribston and Margil. These certainly make young growth more evenly over the entire surface of the tree when the shoots are tipped regularly every year. Young wood is needed to produce continuons crops of fine fruit. In all cases the centre should be kept open. A welltrained orchard tree should resemble an inverted umbrella, the ribs, representing the main shoots, which should be cleared of spray ; the latter does not answer any useful purpose, but the outer branches should be left moderately thick. In fact, in trees that have plenty of room to extend all round,the outer branches require but little thinning. We clear the centre of the trees each winter, and cut out dead wood or weakly growing branches that are being smothered or covered by the stronger growth of younger wood. The erect shoots at the top of the tree are stopped, but even where that is not done a heavy crop brings them down to their desired position quite as effectually as any kind of training.

PRUNING DWARF TREES.—Where the outline of these is formed, all that is needed is to keep them in good fruitful condition by summer-pinching. This not only reduces the necessity for much winter pruning, but it exposes the fruit to increased sunlight, thus improving both appearance and flavour. In the case of dwarf trees it is impossible for fruit to reach even the finish of which our climate is capable if the bushes are crowded with a thicket of spurs and the whole of the young growth is left to shade the fruit, more especially in market gardens where tall standards are planted so thickly as to completely shut out the sun's rays from the dwarf or bush trees with which they are associated If we are to keep our hold on the market, the trees must have more room, and the pruning of dwarf bushes should be done with the view of producing finer fruit than they have hitherto done. If at the winter pruning the spurs were well thinned out, fresh spurs will originate along the entire length of the main shoots. It is not advisable to pinch the shoots before their bases begin to get firm, or about the latter part of July, and then not closer than five or six leaves, as at the winter pruning they can be reduced to one or two buds. I find the secateur a useful implement for thinning overcrowded fruit spurs, and in the case of those that are old and long neglected, a small pruning-saw will be found best for removing them close to the stem, shaving off the rough edges with a sharp knife, so that the cuts may heal over readily.

PRUNING TRAINED GARDEN TREES.—Having got these into form,it will rest with the pruner to keep them in a fruitful state by the judicious use of the knife. During these last few years this has been greatly assisted by summer pinching, and as the trees grown in gardens now-a-days are mostly on the Paradise stock, there is not anything like the disposition to make such a quantity of superabundant wood, more especially on the upper parts of the trees, that there was in days gone by, when the crab or free stock did duty for all kinds of trained or untrained trees. Still, careful manipulation is required to keep trained trees in good condition as regards an equal distribution of vigour, more especially in the case of horizontally trained espaliers and cordons, and to a less extent in that of upright pyramids, the tendency of the upper branches being to monopolise more than their share of the sap This must be remedied by persistent pinching of the uppermost shoots, allowing those less favourably situated to carry all the leaf growth they can, in order to maintain a proper balance in all parts of the tree ; doubtless, however, in time, all modes of training that militate against the well being of the tree will be superseded; in fact, they are so already. The old horizontal espalier is making way for the erect trained cordon.

J. G.

NOTES ON THE POULTRY BUSINESS.

EDS. COUNTRY GENTLEMAN.—If the various diseases which affect chickens could be overcome, they could be made profitable, and at the same time afford work for persons who are not able to labor in the fields, or for women who are not equal to housework. Children would not exercise care enough, but old or infirm people could derive a handsome income, with a small outlay. But, when after all one's trouble and labor the insidious diseases to which chickens are subject, destroy them one by one, until whole broods are gone, it is not only provoking but decidedly discouraging. For a number of years we have given up any attempt to raise chickens at Kirby Homestead on account of the prevalence of the gapes, which killed most of them. This year another attempt has been made to raise several hundred chickens, following the sensible advice of some one to put them upon ground where chickens had never been kept before. This precaution did not prevent the gapes from breaking out among them, and at least a dozen broods were affected in some case one or two chickens in a brood, and in others nearly all of them. Putting dry lime in their throats cured this trouble. With the small ones, the lime was blown into the windpipe from a quill, by holding the chicken's mouth wide open and placing the end of the quill just over the entrance to the windpipe. While gapes are still annoying, the disease is entirely curable.

When this trouble was overcome our expectations in the chicken line became great, and we were sanguine of complete success. Now comes the pip. We know of no remedy for this miserable disease. Only two or three comparatively large chickens have died with it, but one whole brood of smaller ones, one by one, have drooped and stood around for several days, to worry one, and were then found dead. The presence of vermin on a chicken will cause the same symptons as pip, but there is a distinctive disease in chickens which I call " pip, " for which I do not know any cure. It is similar to the pale disease in older fowls, when they appear drooping and dumpish and their combs and wattles turn pale, showing a want of circulation and vitalty. It affect them sometimes for weeks before they die, and I never knew one to recover. Chickens with the pip have been fed black pepper and red pepper, and been fed early and late, but all of no avail. I am inclined to think that the only remedy for pip is in prevention more than anything else. I recollect that the brood which died, and another which is most affected with it, were both badly wetted and bedraggled with rain in their coops. None died at the time, and not for several weeks after did they show any symptoms of the pip ; still I cannot account for these two broods being more affected than the others, unless by the above cause. Vermin will kill chickens, and here prevention can be used most advantageously. Powdered sulphur should be freely sprinkled in the nest when the eggs are put under the hen, and it would be an excellent precaution to sprinkel it in the feathers when the hen is put into the coop with her brood. Grease is a bad thing to use on feathered animals ; it seems to make them sick and sticks their feathers together, so that the little ones get chilled.

To succeed with chickens there must be suitable accommodations. It will not do to confine them in a close coop for any lengh of time, nor will it answer to let them run in wet wea-

ther. They must at all times have pure air and clean surroundings. To effect this there should be two coops, one enclosed all around, with an opening into another, which may be made of lath, and open so as to permit the chickens to go out and in, but at the same time confining the hen. These coops should be moved upon fresh ground every few days. When thus confined, one hen will take care of two or more broods provided she is shut in the close coop at night. Early in the spring chickens are a few weeks old they will eat buckwheat, and this is the best food for them, fed whole. Cracked corn is also good, but not equal to buckwheat. Young chickens are in great demand at hotels and restaurants for broiling, and they will bring a price which makes them the most profitable meat to grow upon a farm, as they will bring from 15 to 25 cents a pound. No other kind of meat can be produced so cheaply, and no other meat will bring, on an average, more than half

YORKSHIRE SWINE.

when the weather is cool, a dozen chickens are as many as should be allotted to one hen, but when it is warm a large hen will take care of twice or three times that number. They should be of as nearly the same age as possible, or else the larger chickens will trample upon and smother the smaller ones.

There is no better food for the young chickens than corn meal, and if it is mixed with boilling water it will be better, but in no case should it be allowed to ferment. When the the price of chickens. A roomy space should be set apart for the chicken yard, and it should be dry and sunny. The coops should be far enough apart so that the young chicks will not stray into the wrong one, as many hens will try to kill every strange chicken which comes into their coop. The night coop should be so tight that the rain cannot beat into it. A grass plat is the best ground, and the grass should be kept closely cut. There should also be plenty of water accessible to all the hens and chickens, and coal ashes in which they can roll.

When the chickens are young they should be kept in the night coop during rainy weather, and also until after the dew is off the grass in the morning. By taking all these precautions, and giving careful attention to all their wants, the raising of chickens can be made successful.

F. D. CURTIS.

Kirby Homestead, N. Y.

MAKING POULTRY PROFITABLE.

Five hundred hens can be made to pay on an average as large a profit per bird as fifty. There often is more fault with the keeper and management than with the fowls. The care of poultry, in order to make it profitable, is no child's play, but a daily task. Chickens are early risers and eager for the first worm. Succesful poultry keepers are full-grown, sensible men and women. They succeed as a matter of course, and the busines looks very easy to outsiders, as in all kinds of enterprises carried on for money-making. One reason why so many fail is because they are not satisfied with the slow working up. There are some who are really fond of the poultry business, who would gladly unite profit with pleasure, but do not know how to manage it. If one is actually willing to work, can endure fatigue, and can control the temper, it is well to begin low down.

Begin (if no previous knowledge has been obtained) with a cock and a dozen hens, and ascertain just how much patience, time, labor, food, and housing, are needed to serve this small stock of fowls, together with their progeny. There is frequently great loss with chickens from ignorance as to feeding. I always recommend small grain, whole, with cracked corn. It must be given freely, increasing the quantity as they grow, and never stinting them while growing, or afterward. If small numbers are kept at first and gradually increased as fast as found profitable, there would be fewer disappointed poultry keepers. There is something in breed, of course, but often more in the keeper. In the first place it is a good thing to understand what the fowls are intended for, whether for eggs or poultry, and treat them accordingly. No one expects to get much flesh on a Leghorn, neither do we expect many eggs from a Brahma.

If the Dorkings were better known, they would be found in almost every case to meet the needs of the poultry keeper for eggs, and especially for poultry where early broilers are required. They are heavy feeders until grown, but then, for their size, they are considered light consumers. Fowls that are in profit must be large consumers, or they will fail to give a profit. In keeping fowls in large numbers, the mistake is often made of herding too many together. They must have room to breathe in, and room to exercise and to scratch. It is as natural for a hen to scratch as to breathe, and when taken out of their natural run she must have something to scratch for. The person who undertakes keeping a large hennery for profit will learn much through dear experience, and if successful will know what it is to work hard.

C. B. *Duchess County N. Y.*

Milk production in Winter and Summer.

We are giving 6 lb. of cotton cake, 1 lb. of linseed, 6 lb. of hay, about 20 lb. of pulped mangel, and 2 bush of chaff per diem to our dairy cows. The cotton cake costs £6 7*s.* 6*d.* delivered at the nearest station, and probably £6 10*s.* before it arrives at home. This means 6*s.* 6*d.* per cwt., about ¾*d.* per lb. The cost of cotton cake is, therefore, 3*s.* 3*d.* per week. The linseed costs 8*s.* per bush., and the cows receive 1 lb. each. It is first crushed in a grist mill; and, after each day's rations are prepared, the next day's allowance is placed in the cauldron and allowed to steep in cold water for some twenty hours. The fire is then lighted, and it is boiled for about four hours, and thus converted into a thick mucilage, distributed through 24 gal. of water. We find the linseed costs close upon 1*d.* per lb., or 7*d.* per week. The linseed mucilage is poured over a couch of straw chaff, and pulped mangel is then sprinkled over at the rate per head above given, and the whole mass is well incorporated by mixing. The cows receive two bushel baskets at two separate times; each basket contains about 24 lb. of the mixture. The cake constitutes a third meal, and the hay is given at 8 o'clock at night, making four meals per diem Assuming the consuming value of water meadow hay at £3 per ton, or 3*s.* per cwt., and taking the quantity consumed at 42 lb. per week, we have here an additional charge of 1*s.* 1½*d.* per week. Mangel is difficult to value, but if we estimate the cost of production at £7, and the crop at 20 ton per acre, we should be correct in calculating this cost upon a basis of 7*s.* per ton, or 4½*d.* per cwt., 20 lb. would therefore cost ¾*d.*, and the charge per week further raised 5¼*d.* The cost of labour is estimated at 1*s.* per week per cow, and this may be made to include coal used in preparing the food and of chaff cutting. We would also be inclined to put down 1*s.* per week for interest and depreciation, &c, on cow stock This is done to cover the unavoidable losses which are caused by cows refusing to breed, slipping, losing quarters, or even dying. We are not aware of any other cost directly incurred by the cows, and should be disposed to notice such other charges as railway carriage on milk, or expenses connected with the making up and disposing of goods, at a later stage. The cost estimated on a liberal scale per cow per week appears then in our case to be as follows:—

EXPENSE OF MAINTAINING COWS IN MILK DURING WINTER.

	Per week.	
Cotton cake (42 lb. per week)	3*s.*	3*d.*
Linseed (7 lb. per week)	0	7
Hay (42 lb. per week)	1	1½
Mangel (140 lb. per week)	0	5¼
Labour and coal	1	0
Interest, loss, and depreciation	1	0
Total	7	4¾

We believe this to be a fair estimate, rather above than below the actual cost—as all good estimates should be. It should also be mentioned that this is the cost of cows actually in milk, and not of a mixed herd of dry and wet cows. They will not average more than 1½ gal. of milk per diem, which at 10½*d.* equals a money value of 9*s.* 2¼*d.* per week, and a profit of 1*s.* 9½*d.*, which again must be reduced to pay for railway carriage, &c Those who dispute our figures would do well to think whether under any system of winter feeding the cost of maintaining a cow can be reduced below 7*s.* 6*d.* or 7*s.* per week. Also, whether a higher winter average than 1½ gal per cow per day can be maintained in a large dairy where a constant herd is kept up, and fed on such moderate fare as the above.

It is during the summer that the chief profit is to be made from cows. It is then that the milk is secreted in the largest quantities and at the lowest expense. When the actual cost is scarcely more than rent, and the cows are paying 10*s.* per week per head, daiying is then truly profitable. Taking the case of 100 acres of grass rented at £2 per acre, 50 acres of which are mown, we might expect 50 tons of hay, which at £4 per ton equals £200, or the rent of the entire 100 acres. Then there is the extra grazing for sheep, work-horses, and young stock, which may perhaps pay for the cost of hay making. The prospect of profit in this case seems more

hopeful than in the picture we have drawn of winter feeding and its heavy costs.

Probably those farmers who put their cows in strawyard during the winter, and contrive for calves to drop in April, make more money of their dairies than those who struggle to keep up a regular supply the year round. On the other hand, good living in winter tends to keep cows up in condition during summer, and the manure made during the winter is of very superior quality to what is produced in an ordinary strawyard. The difference between the summer and winter wholesale price for milk is not sufficient, although we suppose it is regulated by supply and demand. If dairy farmers would make the calculation, and let us known what they are doing in the matter of winter feeding and winter production of milk, the publication of such results might be useful. While supply and demand regulate price, ventilating the subject may regulate supply, and thus indirectly affect prices; for no one is likely long to pursue a particular course after he sees his way to a more profitable one. *Ag. Gazette, Eng.*

STRAW MATS.

THERE is a vast difference between the rough, loosely made straw mats that are often seen in use ard those made in a through workmanlike manner. In the first place the mats as usually made in this country are too thick; the strings are to far apart, and the straw is not of the right quality; the consequence is that when they get wet through in spring, they take a long time to dry, and therefore quickly decay. The employment of unthreshed straw is a step in the right direction; it is indeed the only way to ensure a perfect mat, as straw that has been bruised by the flail or crushed by the threshing machine does not throw off rain as it should do, and soon rots. I have never been able to obtain anything better than hand-threshed straw, but with this I have made mats that with something less than ordinary care lasted three winters. Good Wheat straw will make mats, but Rye straw is far better and lasts longer, especially if cut just before it comes to maturity, as it is then tougher and not so ready to break to pieces when in use, as would otherwise be the case. Those who would like to make their own mats should, if possible, grow the straw for them, as it is a matter of some difficulty now-a-days to get any that has not passed through the threshing machine, and it is utter waste of time and money to make mats of this torn and mangled material. The strings should not be more than 6 inches apart, or the straw will be apt to bulge between them; and not more than five straws should be laid in at a time. This will render the mats uniform in thickness and firm to the touch.

Taking into consideration the fact that a well mae strawd mat will keep out at least three times as much frost as Russian mats, and that when well cared for they will last three times as long, it will be seen that if they can be made or purchased for about 50 cts each, they will be cheaper in the long run than Russian mats. We find that in making them at home they cost about one cent per square foot for material, and a man or woman working briskly would get through some 60 square feet in a day—that is, doing all; but by having a boy to hand straw, nearly double that amount could be accomplished. In Switzerland a mat about 6 feet by 4 feet costs about two francs, but there, as well as in France and in Germany, they are mostly made by women employed on the place, or by the outdoor hands in wet or severe weather. In trade establishments, where there is an indoor and an outdoor department, the outside hands might in inclement weather turn to mat-making, a brisk and cleanly employment that men would like, and which would be much more profitable than a great deal of the work that they do when obliged to go under cover. Some I know object to straw mats on the score of untidiness, as when they begin to wear small pieces break off and drift about, but in trade establishments and market gardens this objections would not have much weight, and even in private gardens there are places where utility rather than neatness should be considered.

CORRESPONDENCE.

DEAR SIR,

Being a young farmer desirous of excelling in the profession, I appeal to you for information upon certain points which at present are exercising my mind.

My farm comprises about 100 acres, fully cleared, and in tolerably good heart, soil principally sandy loam—my stock at present consists of 1 Durham pedigree bull, 1 pedigree Ayrshire cow, 1 pedigree Ayrshire heifer calf, 14 high grade Ayrshire-Durham grade milch cows, and 12 calves of my this year's raising. Three horses, one sow, one hog and four young (Chester-white) pigs.—

My pasture is about 25 acres, divided into one piece of about 13 acres, another piece of 10 acres, and a small strip of about 2 acres. The river Yamaska rises and covers some portions of it during spring floods. What system of top dressing or manuring would you advise to keep it in good condition? When should it be applied, and how often repeated?

Of course some of my meadow land is poor; would my plan (to be hereafter mentioned) meet with your approbation, and will you kindly correct me in my mistakes and advise me?

There is a meadow of about six acres which I understand has not been turned over for about 10 years. I propose ploughing it this or next month, and in spring sowing oats without manure; then next fall again plough it say 6 inches, then spread 18 Scotch cart-loads (of covered shed) manure, then plough it again about 3 inches to turn this manure under, then sow barley and seed down. What mixture of clovers and grass-seeds do you advise for meadow land?

Would meadow land that I do not wish to plough be benefited by the application of say 10 good loads of manure per Acre?

If so, for how long would the benefit last?

Would an application of 200 lbs. superphosphate of lime and 200 lbs salt per acre be of equal benefit, and would it be equally lasting?

Do the salt and superphosphate do to be applied together, or in other words first spread one and then immediately follow with the other?

If I followed a rotation—first year oats on meadow land without any manure or fertilizer; second year corn, roots, or potatoes richly dunged in the hill with old manure; third year barley without manure; fourth year wheat, with 18 loads of manure per acre and seed down?

When is the best time to apply manure on meadow land? when on ploughed land? and superphosphate the same?

If I put in one acre Italian rye grass (lolium Italicum) this fall, or early spring, and ½ acre fodder corn to cut immediately succeeding the rye grass, should I not be able to keep at least 40 head of cattle?

We calculate we cut quite 110 tons hay this summer.

Many of my questions may appear elementary; but I wish on good authority to thoroughly understand the various points raised.

Your kind attention will greatly benefit me. H. T.

Dear Sir.—I was pleased with your letter of yesterday, and shall answer your present, and all future, questions with much pleasure, as well as I know how.

In my opinion, success with stock does not so much depend on the number of head a farmer manages to keep on a

number of acres, but how much butter and cheese, or beef &c. he can make, and, more particularly, what net gain his stock gives him. *One* cow well fed, all it can eat clean, will generally give more net profit than *three* cows poorly fed.—My experience goes to show that, as a rule, farmers do not more than half feed their stock, thereby losing the largest part of their possible profits every year.

My advice, therefore, would be: Feed your stock highly, both winter and summer; make sure of an abundance of stock food for at least one year in advance,—and then increase your stock in proportion to your food supply. With high farming, and the purchase of some grain or cake for cattle food (instead of, or in connection with artificial manures), it is quite possible to keep forty head of cattle, of different ages, on one hundred acres, besides the horses and pigs you mention. However, a few sheep of the best breeds might replace some horned cattle with advantage, as sheep will feed comfortably on what horned cattle leave.

Taking it all in all, I suppose the cheapest and best top-dressing to pastures is a little crushed grain, or cake, fed to stock regularly all the time. The next best is a slight coating of well made manure applied in the fall before winter frosts set in. If, to the above, you add a thorough harrowing, early in the spring, as soon as the horses can travel over it without sinking, also an application of, say, one hundred and fifty pounds of land plaster, and immediate rolling afterward, it should make the pastures as rich as possible. Where facilities exist for composting the cleanings of ditches with quick lime,—an application of three or four tons of air-slaked lime—besides the earth in the compost, would be generally of great benefit to most meadows and pastures, and should be applied *before* fall rains set in.

The next best plan of *improving* pastures is to grow green food of some sort to supplement the pasture food the whole season through—beginning with fall rye, then clover, then tares and oats, then Hungarian grass, then second crop of clover, then sweet-corn fodder.—Of course, any such superabundance of green food should *all* be saved for winter's supply. Two or three acres of such green food, grown quite close to the pasture, and *most highly* manured, will give as much food in a season as would six times the extent of good pasture. Clover, highly manured, can be cut four times.

You do not give me any inkling as to the rotation you now follow. I see by your letter that on your hundred acres of cleared land you have in pasture twenty-five acres; in hay hundred tons, equal to a fair crop on seventy acres, leaving only five acres for corn potatoes, and grain. I infer therefore that your hay crop has been more than a good average, which is one ton and a half per acre. I shall be glad to hear from you again on this and other points.

Again you speak of breaking up what I take to be your oldest meadow, about ten years old This should require a cleaning crop—potatoes, corn, or roots, after the oats. Twenty-five Scotch cart-loads should suffice for this crop per acre.

Seeding here is most profitable with mixed clovers, principally alsike, red top and timothy. I know of no grasses to give better meadows. High land, however, might be sowed in June grass and orchard grass, besides clovers. This should be cut early, as they ripen before timothy. There is, moreover, an advantage in having early and late meadows to cut, one after the other, thus extending the haying season.

I see you keep your manure under a shed. This is excellent; on the condition that it be perfectly trodden and that the liquid manure from the stables be also collected and spread *over* the mass of solids, in order to prevent fire-fanging and also saturate the mass and cause perfect fermentation, without over-heating.

Meadow land would be greatly benefited by a top dressing in the fall of ten good loads of manure, the effect of which would certainly last three or four years, especially when not overpastured in the fall.

I cannot advise with certainly respecting the application of two hundred pounds of superphosphate and an equal quantity of salt per acre as a top dressing on meadows. Salt is not always useful, and should be treated with care, on a small scale, under various circumstances. As to the superphosphate, I should prefer to use it in addition to the manure you intend to give to your root crops.

Allow me to suggest a slight change in your rotation, which I strongly recommend, viz:

First, oats; second, hoed crop with manure; third, barley and ten pounds mixed clovers; fourth, clover, *with* top dressing of superphosphate and plaster—(two crops) fifth, wheat with grass seeds (as above)—*meadows* thus made, *in well cleaned soil*, and top dressed every third year, should last ten years. Should your meadows prove foul, they would have to be broken up somewhat sooner.

I take it that your pastures are on the banks of a river and inundated from time to time. Such pastures, with the treatment suggested above should become excellent permanent pastures, and need not be broken up at all, with the exception, perhaps, of the small patch of two acres or so which I suggest to have in green food near the stables or the pasture, and which can also grow a rotation of green stuff *in the same field*; the clover alone being supplied from the clover fields in the rotation. But, to obtain an abundance of green food from the same field year after year, an abundant supply of the best manure would be required, that is, farm yard manure with an addition of, say, a hundred pounds of nitrate of soda and two hundred pounds of plaster.

I have advised feeding ground grain to your stock. Perhaps the young stock might do without it, but your cows should give you a fair profit, and plenty of rich manure for your pasture, were each cow supplied with, say, two dollars worth of crushed grain monthly, each, whilst on pasture. You might to try the experiment on your young stock—say, on half your stock,—of feeding one dollar's worth of grain each, per month, taking girth measurements of all, every month, of those fed and unfed, and comparing results.

WINE-MAKING.

Many people in this province having planted vines on a more or less extended scale, we receive every year a quantity of letters, asking for a recipe for the manufacture of wine. As the plant is cultivated, here, under special conditions of growth, it follows that its fruit differs slightly in quality from the French grape, and, thence, it follows that the system of manufacture must be also slightly different.

This difference has necessitated a special study of the question, in our province, and it is only after many an experiment that I have succeeded in making a palatable wine. I must say, here, that after three years work, I have succeeded in obtaining a result more than satisfactory, since a French *amateur* has admitted, after tasting my wine, that it was the first American wine he had drunk which was at all comparable to a good ordinary French wine. Backed by this approval, I think I am now justified in laying down the following rules for the manufacture of wine:

Vintage.—The grapes must not be gathered until they are perfectly ripe. It happens sometimes in our rigorous climate, that, for fear of an early frost, we are obliged to gather our grapes before every berry on the bunches is ripe. I think, in this case, it would be well to strip the bunches, and to throw aside the unripe grapes and the stalks.

When stripped, the berries must be crushed. This may be done by hand, but when great quantities are used, this

would be too slow a process, and I find the "Combination Fruit-press" an excellent assistant in this part of the work. I used it last year to great advantage. See French Journal for July 1883.

The must.—The grape-juice, with the crushed berries, is called, in technical language, the *must*. In our province, the principal defect of the must is want of sugar. It is on the richness in sugar that the quantity of alcohol in the wine depends. Without alcohol the wine would not keep; it would want *body*, and we should be far from having that generous, strengthening beverage we seek for. A cheap little instrument, called the *saccharometer* or *must-weigher*, tells us exactly how much sugar the must contains That a wine should contain enough alcohol when finished, the must should show ten degrees on the instrument. Thus, by adding sugar to bring the must up to the desired point, the wine-maker who possesses this saccharometer will be working with a certainly that he is in the right road. The added sugar must be *white crystallised sugar of the best quality;* any other sort will probably injure the wine. Those who have no instrument had better be satisfied with adding half a pound of sugar to each gallon of must. It is better to wait until the fermentation has begun before adding the sugar, which should previously have been mixed with a little of the must.

Fermentation.—In order that the fermentation may start rapidly, the must should be at a temperature of 68° F. or 20° centigrade. A short time after the fermentation begins the *chapeau*, in English distilleries called *the cap*, forms; that is, the crushed grapes are raised to the surface, where they form a high mound just like a hat. Three inconveniences arise from this: first, the cap thus exposed absorbs ferments which tends to sour the must. Then, if well coloured red wine is desired, the position of the berries at the surface prevents their imparting their colour to the must. Lastly, the must being in danger of souring if it is left too long exposed to the air, it becomes necessary to *rack* it too soon—another cause of want of colour. To obviate these inconveniences, the following plan has been found to answer. (1)

On a tub or barrel place a cover, made of groove-and-tongued boards, fitted so tight that no air can enter, and cover it with a layer of moistened plaster (burnt, I presume; commonly called P. of Paris. A. R. J. F.), half an inch thick: this, hardening immediately, will prevent any introduction of air. A hole, eight or ten inches in diameter, is made in the cover for the admission of the must, which is to be closed hermetically when the must is all in. Then, the end of a lead pipe—half an inch in inside diameter—is introduced into the cover, which (the pipe) is so curved as to admit of its other extremity being plunged into a vessel of water placed on the bench on which the tub rests, to allow the carbonic acid gas, which is developed during the fermentation, to escape, and at the same time to prevent the slightest introduction of atmospheric air. A tap-hole must of course be made to admit the tap used in racking. If the fermentation be sluggish, a small quantity of the must heated to about 150° F. will quicken it. In following out this system, the must may be allowed to work for fifteen days.

Racking.—At the end of fifteen days—at all events when the first tumultuous fermentation is done, the must should be racked. The best way is to draw it off by a syphon reaching to within four inches of the vat's bottom (2)

I may as well mention here that a wine of the second quality may be made by throwing over the must as much water as the wine withdrawn represents, and adding a pound and a half of sugar to each gallon of water. The sugar should be added *at twice*, half in the water, and the rest when the re-fermentation declares itself. The wine should be racked into a perfectly clean cask, and a bung should be inserted in the bunghole, though not driven in. In this vessel, the wine undergoes its last visible fermentation, and at the end of three or four months it is finally racked, by means, again, of a syphon, into a cask, which is then tightly bunged down. If the quantity is small, it may be bottled from the *cleansing-cask*.

If *white wine* is wanted, it is only necessary to remove the skins after crushing, putting the juice alone into the vat. The other operations are the same.

Wine takes at least a year to finish its work, and improves by age up to a certain point. My own wine has been made of a mixture of equal parts of Isabella and Concord grapes. I have also tried our native wild grape (*vitis riparia*), and the result has been a deep-coloured, strong wine, of excellent quality.

There are five points which, in conclusion, I may say are absolutely necessary to successful wine-making in our province: First, ripe grapes; second, stripping the bunches and rejecting all unripe berries; third, the exclusion of atmospheric air in the fermentation; fourth, the addition of sugar to supply the amount of alcohol necessary to the preservation of the wine; fifth, don't be in a hurry to taste the wine before it is at least a year old. (1)

It must be understood that I do not pretend to lay down hard and fast rules for wine-making in this article. Doubtless, wines can be made in other ways. But it has been my wish to show how I have succeeded in this province, where the vine is subjected to a climate much more rigorous than the climate of France or of the United States, and is, in consequence, less amply provided with sugar. (2)

From the French.

J. C. CHAPAIS.

(1) Pasteur's great work on *fermentation* is well worth the study of any one intending to make wine on even a small scale.
A. R. J. F.

(2) A bent lead tube answers perfectly. A. R. J. F.

De Omnibus Rebus.

Some very funny things appear in our U. S. exchanges; for instance: N. J. S. is in doubt whether in drilling wheat in the fall the rows should run N. and S., or E. and W. Last fall he drilled several pieces, some one way and some another. Two plots were taken as an experiment and treated with great care; and seemed well able to withstand the winter. "The constant thawing and freezing weather which we so often have in the latter part of winter and early spring came on, and I examined the plants frequently. I found they were fast freezing out, the ground seeming to throw the roots out and thus killing them. The crops on both plots, when I came to harvest, were light. But that on the plot where the drill rows ran north and south was fully one-third heavier than the other, and yielded five bushels to the acre, while the other yielded a fraction over three bushels. Neither plot came up to the remainder of the crop on the farm, although given the best care."

Fancy half a column of print occupied by an experiment such as this, where the whole crop of the wheat-field was little more than five bushels to the acre!

Again, A. P. S. says that he has never seen a soil that will *sink manure:* I suppose he means "in which manure

(1) If any wine-maker can resist the temptation to see how his wine is getting on at least once a week, he must have much more self-control than I.

(2) Want of sugar is, of course, want of alcohol; no other substance but sugar forming alcohol. But whence the want of flavour?
A. R. J. F.

will sink" out of the reach of the roots of the cultivated crops. I thought every body knew that all the soluble parts of manure were washed out by the rain, sometimes through the subsoil, and sometimes, as in undrained clays, down the water-furrows. The grand point is, as Lawes has shewn, to get the land into such a state that the nitrogen, phosphoric acid, &c, may be caught by the roots before they can escape. A. P. S. talks of "impervious clays;" he digs a hole, he fills it with water, which water remains till it evaporates, and he does not see that in digging the hole he "puddled" the bottom: a drain, laid down in a proper manner, would soon show him that his clay was not impervious, and an analysis of the drainage water would shew him that the best and most costly parts of his manures do sink through the land, clay though it be.

Single versus double-horse carriages.—I have tested for myself the relative advantages of one-horse-carts and waggons in harvesting both hay- and grain-crops, and I find, after many experiments, that three horses in carts will do as much work as five horses in waggons. I have put up, in one day, three stacks of wheat-sheaves averaging four hundred bushels each stack—horses and carts employed, nine. My neighbour, with the same number of horses and four waggons hardly completed his second stack in the same time. The distance traversed, was the same in both cases. This was in England, just thirty years ago. The points to be attended to in building such carts as I speak of are these. First, the body to be as near the ground as convenient, and second, the load to be placed in such a way that the inclination be to shake down towards the centre, wherefore, the hind- and back-rails or ladders must have a slope towards the centre. Moderate-sized loads will get over the work quicker than big loads: there is much waste of time in getting up the last 25 sheaves if the straw is dry: they often slip off and cause double work.

A large dealer in artificial manures tells me to-day (August 17th) that he has only sold *five tons* of superphosphates, bone-dust, &c., for use in the province of Quebec and the Eastern part of Ontario, during the season of 1883! Compared with the quantities of these manures employed by the farmers in the States as aids to farmyard dung, these sales are insignificant, and I was not surprised to hear that the dealer in question was about to relinquish his business in Montreal.

Loads of dung.—A very vague phrase—a ton or a cubic yard of dung may be a convenient way of expressing approximatively a certain quantity of manure, but even then, much depends upon the state or condition of the manure. Hence, when I see thirty loads of dung recommended as a dressing for an acre of land in this province, I conclude that the carts are very small, or the dung very light and strawy. But, when I hear an Englishman talk of ten cubic yards, or a Scotchman talk of ten tons of dung, I can form a pretty fair estimate of the quantity employed.

Preparation of land for roots.—The finest crops of mangels I ever saw were grown by Lord Lovelace, at Ockham, in Rutlandshire, Eng. The system that used to be followed at Ockham is peculiarly suited to heavy lands, and as mangels do better on the raised drill than on the flat, I can recommend all growers of that root to give Lord Lovelace's plan a trial next spring: it is as follows:

Seven or eight loads of dung (of fifty cubic feet each) are laid on the stubble in the fall and ploughed down. In the spring, it is cross-ploughed and well grubbed, and harrowed to a smooth surface. As soon as possible after this, the ground is drilled up at a width of thirty inches with a double mouldboard plough, and the subsoil-plough follows immediately along the furrow, stirring the land ten or twelve inches deeper. Eight or ten more loads of dung are spread between the drills and covered by splitting the drills as usual. The seed is then put in, with or without bone dust or other aids; and as soon as the plants are up, the spaces *between* the drills are subsoiled, so that the whole of the field is thoroughly stirred, and the young mangels are then set out in the ordinary way. The effects of the second subsoiling, when I saw the farm, in 1845, were very apparent. Five or six weeks after the plants were up, the rootlets or fibres were nearly "shaking hands" across the spaces between the drills; the subsoiling in the furrows had heaved up the drills on which the plants were growing, and they seemed to float on the soil. The farm-manager told me at the time that the plants occupied the entire surface so rapidly, that, after setting out, no hoeing was required: the shade of the leaves prevented a weed growing.

This system seems to me to unite the best features of drilling on the raised surface and on the flat: the dung is close to the seed, and yet, after the second subsoiling, the plant finds itself on an almost perfectly level bed. Subsoiling need not terrify any body, if conducted in this way, as only one team is at work at once, whereas, when the usual plan is pursued, the subsoil-plough must follow immediately in the track of the other plough, and a lot of horses are required. A strong, broadish share on any plough, with a wheel in front on the beam, and the breast taken off, will answer pretty well for this purpose.

The crop of mangels at Ockham averaged, I was told, forty-eight tons an acre.

We used not to care much about trotting races in my time in England. The taste was all for flat-races under saddle—even hurdle races and steeplechases were considered *infra dig.* Still I should be the last man in the world to wish to detract from the credit the Americans deserve in having reduced the time occupied in trotting a mile from 2. m. 50s., to 2 m. 10¼s. Maud S., who has "made that time" must be a wonderful beast. Still, it is not fair to compare her with our English racers over the flat, as they start from a standing position, whereas the American trotters come up at full swing—*scoring*, as it is called; it is not the horse that can gallop the fastest over a mile, or a mile and a half, that wins the race in a Derby or St. Leger; he must have pluck enough to stand being *collared*. I remember well, too, when, thirty years ago, Mr Ten Broeck sent his good Virginia horses over to England; the boys (negroes) sent their nags off at score, and our English Jocks could hardly sit on their saddles for laughing. In a little time, the foreigners began to "come back" to our horses, and after the distance post, were entirely out of the race. With Newmarket boys up, however, Ten Broeck's nags showed that theirs was not the fault. Oh! that wonderful turf at Newmarket; six inches of sandy loam on a subsoil of chalk; as springy as a fiddle-string, and as dry as an ash-heap an hour after the hardest rain.

Ellis of Barming, near Maidstone, was the largest Hop-grower (in acreage, not in corporeal measurement, though he was a portly man, too,) in England. His orchards were as extensive in proportion, and he thoroughly looked after his business. Wherefore, as we seem to be going largely into the fruit business in this province of Quebec (whether wisely or not I do not say, though I have my own opinion), I offer a plan of Mr Ellis' for the destruction of insects—blight, as we Kentish people call it—on apple-trees. Poor old fellow! I

knew him well, when I was a boy; his heart was in his hops, and his fruit, and his poor people. He died insolvent, in spite of his exertions, but his name is respected all over the dear old county.

"On an orchard of thirteen acres," says he, "for nine successive years both blossoms and leaves of the apple-trees were completely destroyed by caterpillars, before I commenced smoking them, and for the ten subsequent years I never lost the crop."

The smoking is done by placing a large covered iron tub, with a hole at the bottom, on four low wheels, and putting dry wood, with any weeds and rubbish, sprinkling *brimstone* on the smouldering stuff from time to time, and forcing it to burn by a pair of bellows, which drives a strong and continuous stream of disagreeable smoke through a movable tube to every tree, and every part of a tree, in succession. By constantly commencing on the windward side of the orchard, and following up row by row till the moth disappears, I prevent it producing caterpillars, and consequently save the crop."

"Donaldson asserts that the properties of a milch-cow and of a cow disposed to fatten are quite incompatible. This must be entirely a mistake. The very circumstance of a cow yielding much butter in her milk shows that her food is readily converted into fat. She would not be a good milch-cow if she fattened at the same time her milk was being secreted. But when the milk has ceased to flow, then she must have an aptitude to fatten rapidly."

The above is a quotation from an essay by Dr Lyon Playfair, written in 1844. How thoroughly the knowledge of *facts*, learnt since that time, has proved the utter weakness of his *theory!*

I can recommend to every fruit-grower a book that has been sent me for review. It is styled, "*Insects injurious to fruits*," by William Saunders, F. R. S. C., and a host of other honorary titles too numerous to be mentioned. The engravings are beautifully executed, and the whole work bears marks of having been carefully studied. Published by Lippincott and Co., Philadelphia.

Feeding animals, by Elliott W. Stewart, one of the editors of the "Live Stock Journal," is, *meo arbitrio*, rather too long spun out for general use. Still, a great deal may be learnt from a patient perusal of it, and the description of the points of a *mulch-cow* is very good. Practice has always been in advance of theory in feeding animals.—A. R. J. F.

Hot Water for Insects.

It has been many years since we first employed hot water for killing destructive insects, but never with the accuracy of the experiments described in a late number of the Gardeners' Magazine of London. A large number of experiments were made with different plants, to determine what degree of heat they would bear without injury. Among the plants which would bear 140° without being harmed, but which were hurt at 150°, were centaureas, sedums, fuschias, calceolarias, petunias, ferns, and several others. It was curious, that all the plants tested would bear nearly the same degree of heat, with scarcely any variation. Pelargoniums were unhurt up to 150°, but the slightest rise above killed the young wood and leaves. It is probable that the same result would take place with hardy plants, and the green shoots and leaves of trees. The question next occurs, what insects will yield to this temperature or to one some degrees lower? This information is not furnished by the Gardeners' Magazine, except that aphides quickly perish in water heated to 120°. The practice has been adopted by nurserymen for clearing their young pear, cherry and other trees in the nursery rows of the aphides which have infested them, by bending the branches which they covered so as to immerse them in soap-suds, which has proved effectual; but doubtless a better way would be to use hot water, the temperature of which could be kept at the right point by the use of a thermometer, and by occasional additions from a vessel kept heated to boiling.

A useful series of experiments, easily performed, would be to ascertain what insects would yield to this hot bath, might be tried on rose bugs, slug, currant worms, or any others which feed on or occupy the green and flexible shoots of plants and trees. A most important advantage of this mode is that it leaves no defacing or hurtful poison on the plants.

In the experiments which we have performed for many years in destroying the cabbage-worm with hot water, the precise temperature could not be determined by using the thermometer, as the plants could not be immersed, but must be treated by showering from a watering pot. This required some care and judgment, and was not therefore so well adapted to kept quite hot in the vessel, as it was necessarily considerably cooled in the fine jets through the air from the rose, and when too hot, the application must be for a briefer moment than when the temperature is lower. It is worth while to ascertain how low a point will be fatal to them, and then fill the watering pot with water a few degrees higher, and apply it promptly and freely, keeping a thermometer on hand as a guide. A certain and successful application of this remedy, easily performed, would be of great value to the cabbage-eating community.