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The Field.

New System of Potato Culture.

At a recent meeting of the Society of Arts in England, Mr Shirley Hibberd, a distinguished authority in all rural affairs, read a paper on the cultivation of the potato, which propounded a new and singular method he had been led to adopt, as the result of considerable thought concerning the nature and habits of this important esculent, and long-continued experiments in growing it. In giving the substance of his views, we shall omit altogether a somewhat lengthy discussion of the various theories which have been suggested by way of accounting for and preventing the potato disease, the continued prevalence of which in Britain is the great difficulty farmers and gardeners have to combat in their endeavors to grow the potato. Suffice it to say, that Mr. Hibberd traces the disease to excess of moisture and lack of heat. He supports his hypothesis by a description of the soil and climate of those regions where the plant is found growing in a state of nature, and also by a comparison of seasons, going to show that the best crops have uniformly been obtained in those years when dry, hot weather has most prevailed, and the poorest ones when there has been special humidity of atmosphere, and a low average of summer heat. He refers to the fact, that the potato is a native of the warm, temperate regions of the Western continent; and that it is never found growing wild, in either a sub-arctic or a tropical climate. The mean annual temperature of those countries of which the potato is a native is from 62 to 72 degrees, that of London is under 50 degrees. The plant evidently needs the best climates of the South of Europe, and accordingly, in those localities, the disease is hardly known, and the tubers grow to an immense size. In the course of 47 years, during which a careful record has been kept at Chiswick of the average temperature during the five growing months, it has been ascertained that the mean is rather more than 59 degrees. In the year of the potato famine in Ireland, the temperature was unusually low, reaching only a little above 56 degrees. In the year 1860, when the sun was obscured for months together by rain-clouds, the mean temperature was about a degree less, and, during that season, disease well-nigh extinguished the potato plant. Not only was the sun hidden for long periods during that summer, but the rain-fall was excessive. In 1868 and 1870, the weather was very dry and hot for England, and, those years, the potato crop was good. An extended series of comparisons tells the same tale, though not so strikingly. Looking at these considerations, and believing that the potato is dependent for health and fruitfulness on continued solar heat, Mr. Hibberd reasoned, that if artificial sunshine could be maintained above the

surface of the ground, and artificial sun-heat below, the crop might be ensured when natural sunshine fails, and the ground is disastrously cooled by super-abundant rain. The practice, so common, of ridging potatoes on heavy land, in order that their roots may get a maximum of ground heat, and be quickly drained of superfluous moisture by means of the troughs between the ridges, appears to have suggested to Mr. Hibberd the method he was led to adopt, which we will allow him to describe for himself.

"It will be obvious that the advantage of the ridge and furrow system would be considerably increased were we to pierce every ridge with a tunnel, for this would ensure beneath the roots of the plant a body of imprisoned air, the non-conducting property of which would render it a store-house of solar heat, maintaining the temperature of the soil nearly at the point it had attained before the weather changed, and while favoring the rapid escape of surplus moisture, acting mechanically as well as nutritively to sustain the health of the plant. I shall endeavor to show how this may be done. In the year 1864, having reasoned out the case in much the same way as I now place it before you, I prepared a plot of ground for an experiment, to test the value of my conclusions. I procured a quantity of common roofing tiles, laid them in lines on hard ground, laid potato sets on them, and then covered sets and tiles with prepared soil, so as to form a long ridge covering a shallow tunnel. The result was a remarkably heavy crop, the texture finer than the average, and without a trace of disease. I then resolved to improve on the plan, by providing a better tunnel than was possible with the nearly-flat roofing tile. The result was the adoption of a tile made expressly for the purpose, and known to the few friends who have taken an interest in my proceedings as the 'Hibberd potato tile.' It is a foot wide and fourteen inches long, the form that of a low, flat-topped arch, four inches deep in the centre. I obtained a supply of this tile from Messrs Seales, of the Potteries in the Green-lanes, Stoke Newington in 1865. There was no stint of clay or fire in making them, and they prove to be capable of wear-and-tear to a surprising extent, considering that they have to be roughly handled. The best way to use this tile is to lay down lines four feet apart, on hard ground; and as the sets are laid on the tiles, they are moulded over with earth from the intervening spaces. The result is a series of rounded ridges, so far separated that the potato plant enjoys abundance of light and air, lodgment of water is impossible, and in the event of a sudden lowering of temperature, when the tubers are ripening, the storage of earth-heat below the roots takes the crop over the time of danger, and prevents that engorgement of the tissues which constitutes the first stage of the disease and the nursery for the fungus. As a matter of course, the intervening spaces should be deeply dug and liberally manured, and planted with suitable crops. They must be such as will not rob the potatoes of air or light. The cultivator will have no trouble in determining how to utilize the furrows. In the garden they will be found admirably adapted for celery, late dwarf peas, broccolis, and winter greens. In farm practice it would probably be best to leave the furrows open, because the sort of potatoes selected would profitably utilize the light and air, and in strong land really meet across the furrows. Here, of course, we encounter the question, *What is pay?* It must be confessed that the Hibberd potato tile is a costly thing, for Messrs Seales cannot now produce it at a lower rate than from £6 to £8 per

1,000, and, for the sake of a datum, we may reckon that the cost would be £7 per 1,000, or, if laid in lines four feet asunder, £66 3s. per acre. The cost of the common ridge tile at the present time is £3 10s. per 1,000, but this is only 12 inches long, and the saving is less than appears. It would be good practice, however, to lay these a yard apart, the cost in this case amounting to £51 9s. Those who raise or speculate in new varieties, and who are familiar with the difficulty of obtaining a stock quickly, to ensure a high price in the market, will not regard the tile system as costly, provided only that it affords substantial help to save the crop in a bad season. As a matter of fact, if the tile system is properly carried out, it will in a run of years produce full double the weight of potatoes that would be produced on the same land without its aid; and it has this peculiar advantage, that by saving the crop in a bad season it provides the cultivator with something to send to market at a time when prices rule high, and potatoes are regarded as articles of luxury. But we must test the tile system on the land of the man who grows potatoes for market. With a good season, good land may be reckoned to produce potatoes at the rate of eight tons per acre, which, at 120s. per ton, will be worth £48. If we estimate the crop on the tiles at sixteen tons, the total value will be £96, from which we must deduct £6, being 10 per cent. of the cost of the tiles for interest on the investment, which reduces the value of the crop to £90. This shows a balance of £12 per acre in favor of the tile system. But suppose we estimate the crop at twelve tons, the value will then amount to £72, showing a balance of £18 in favor of the tiles. It will be observed that, in a hot and dry season like that of 1870, the difference in bulk and quality between a crop grown without and another with tiles will be trifling, so as to show the least advantage of the tile system; while in a season characterized by a copious rain-fall, the difference will be the greatest, for as a matter of fact, when disease prevails and there is said to be no crop, there is usually a prodigious production of tubers, and the misfortune is that the majority of them are worthless. It is in such a season the tile system will tell its proper story. The heavy rains that spread disease on every hand will benefit the crops that are protected by tunnels, and the enormous production that follows upon thunder weather in the height of the season will be saved for our use, when, if not so aided, they would simply rot and make the very atmosphere offensive. Let us then suppose that we have a forward, genial summer, occasionally interrupted by electric storms and days of tropical heat and rain. In such a season the potato crops on well-drained fertile sandy soils are usually great, while on the heavy lands they come to nothing. But if on these heavy lands we employ tiles, we may expect to dig twenty tons per acre. The contrast in such a case may be put thus: Produce of one acre on the flat, nothing, produce of one acre on tiles, 20 tons at 120s., £120. When a proper reduction has been made for interest on cost of tiles and loss by breakage, the balance will prove the potato to be one of the most profitable plants in cultivation."

We have not drawn attention to this novel style of potato culture, with any expectation or desire of its being adopted by Canadian farmers. It is questionable whether it will eventually be found to pay English agriculturists even with their far cheaper labor and much better prices for produce. As in most cases of the kind, the calculations of Mr. Hibberd are based on the supposition of the best success being realized as a constant thing—a supposition which

we never find realized in the actual routine of farm practice. That serious and dignified journal the *Mark Lane Express* waxes rather facetious over the matter, advertising to it editorially as follows:—"A scientific old gentleman of somewhat primitive habits once declared that with a little more soil, otherwise dirt, he could grow turnips on the top of his head; while Mr. Shirley Hibberd, in a really interesting paper which he read at the Society of Arts, solves one of the difficulties of the day by growing potatoes on the top of his tile."

There can be no doubt that the paper of Mr. Hibberd, and the discussions to which it has already given and will continue to give rise, will induce more experimenting and have their effect in leading to more intelligent methods of potato cultivation. Besides its interest and value as a piece of agricultural intelligence, Mr. Hibberd's paper conveys a very important lesson and suggestion to Canadian farmers. The lesson is on the importance of drainage. If we do not plant our potatoes on drain tiles, most certainly we ought to lay courses of tile drains under our potatoes. No crop needs well-drained land more than this one, for stagnation of water and redundant moisture are fatal to its health and productiveness. The suggestion is, whether the best method of potato-planting would not be to deposit the sets right on the level surface of the land, and instead of striking a furrow to bury them in, run the plough on each side of the row of seed, lightly covering it with earth at first, and repeating the process in the after cultivation of the crop. Our climate must be far better than that of England for potato cultivation, if Mr. Hibberd's views are sound and correct respecting the conditions required by this plant, in order to healthful and fruitful growth. The average of summer heat is considerably higher than that of London; we have a less rain-fall, and, on the whole, the tendency here is rather to the extreme of heat and dryness than in the opposite direction. Careful culture on fertile and properly-drained land will undoubtedly secure, without fail, one year with another, a remunerative crop of potatoes in this country.

First Prize Farms in Australia.

The Victoria Department of Agriculture have offered prizes for the best farms of a certain size and acreage. The following is the report upon the competition:

The farm of Mr. A. Anderson, known as the Green Hill farm, is situated on the slope of one of the famous Bullarook hills bearing that name, and contains 590 acres, principally of chocolate soil. The situation of the homestead, as far as scenery is concerned, is unrivalled in the district, as it not only commands a fine view of all the surrounding country, including Kangaroo-hills, Kooroochean, Moorookyle, and, nearer home, Birch's Scrub, Forest and Spring Hills, but has two beautiful sheets of water within a short distance, namely, Hepburn's Lagoon, within a mile, and the reservoir of the Clunes waterworks, the waters of which are only separated from the boundary fence by the main road to Rocky Leak. The land is principally laid down in grass, it being the proprietor's intention to grow wool in future instead of so much cereal crops. There are 170 acres of cultivation, including wheat, oats, barley, and potatoes; of the latter there are about twenty acres. The farm is subdivided into a number of paddocks, the whole of which is surrounded by a substantial, close three rail fence perfectly sheep-proof. There is no less than seven miles of good fencing of the 530-acre block, three miles and a half of which have been sown this season with kangaroo acacia. On the north-western side is a paddock, containing sixty acres, laid down in rye-grass last summer, the quantity of seed sown was one bushel of rye-grass and four pounds of red clover to the acre. The crop is a good one, but the clover has not quite destroyed the sorrel, being only its first year, the paddocks which have been sown a few years being tolerably free from this weed. This paddock has been nine years under cultivation, and two years in fallow; the hay crop off it last season yielded two tons to the acre. Adjoining this is a 72-acre paddock in grass, sown with a crop last year. Four hundred sheep of the Cotswold breed obtain the principal sustenance from these two enclosures, and they

evidently thrive well, for they are rolling fat. South of the homestead is a paddock containing 55 acres of wheat, purple straw; the crop is a very heavy one. This land has also been nine years cultivated, and fallowed one year. We next came to a 17-acre field of clover and grass, forming a rich pasture, such a one as cattle like to luxuriate in. This land, which has been cropped in every respect similar to the other grass land, exhibited the advantage of a superior system of draining. There are in this and the other paddocks between 1,100 and 1,200 chains of drains, ranging from two feet six inches to three feet in depth, which are all partly filled up with stones and earthed over. The next field contained 45 acres of grass and clover, laid down two years ago, after five crops had been taken off it. Between 300 and 400 well-bred long-wool sheep are grazing in these paddocks. The adjoining division contains 35 acres of grass, laid down three years ago. The crop is a light one, as the land is poor soil; four crops had previously been taken off it. The next is forty acres of bush land, heavily timbered, and well grassed and watered. In this paddock were quietly browsing three or four capital Clydesdale draught horses of the right stamp, the identical ones which were awarded first prize for a team of four wagon-horses at the recent Agricultural Show at Smeaton. We next came across a forty-acre paddock of grass, sown last year after ten crops and twice fallowed. Thirty-five bushels of wheat to the acre were taken off this land last year, and from an adjoining paddock of thirty acres thirty-eight bushels of wheat were thrashed to the acre the same season. This brought us to a small clover paddock which surrounds the homestead, which consists of a large and substantial comfortable wooden dwelling house with kitchen attached, a small garden in front containing fruit trees and flowers, and a large one at the rear devoted to an orchard. The kitchen is supplied with water from a large brick tank cemented, capable of holding 5,000 gallons of water, raised by means of a force-pump. The barn, which is built of blue stone, is capable of storing 12,000 bushels of grain, and is so admirably adapted for the saving of labor, that a wagon can be drawn up at the rear and then be on a level with the first floor, a staging which runs out from the building enables the bags to be trucked in off the wagon, after which it is emptied out of the bags through the openings in the floor, one of which is over each bin. The front of the barn has the same advantage, as bags can be wheeled out from the bin to the wagon. The other improvements consist of a stable for eight horses, chaff-house, fitted with chaff-cutter, by Bunce, with horse-works; hay shed alongside, capable of holding twenty tons of hay, cow-shed and stock-yard, men's butts (three), wagon-shed, wool-shed, and drafting-yards for sheep, &c. Everything about the homestead betokens order and regularity; there is a place for everything, and everything is in its place. Independent of the numerous running streams and rivulets on the farm, there are two wells, besides the tank, for convenience in watering stock; the water is raised in each by force-pumps. Although there is little danger of getting bogged with a load with such cattle as Mr. Anderson's, yet, as a precaution, he has had half a mile of metal road constructed leading from the barn to the main telegraph road, which has been rolled and levelled by the steam road-roller. The stock consists of six draught horses, one buggy horse, 300 sheep, two excellent milk cows, and several pigs. The machinery is of a very superior description, and includes a thrashing-machine, with eight horse power portable engine, by Ransome & Sims; two reaping machines, by Grant & Nicholson; two double furrow ploughs, by Kelly & Preston; two single ploughs, by Grant; three pairs of harrows, two drays, and one spring cart. In addition to the paddocks enumerated, Mr. Anderson has about 100 acres in cultivation, extending to the banks of Birch's Creek, and recently leased to the late Mr. George Clark, the crops on which are of a very fair character.

Mr. W. Macpherson's farm, which was awarded first prize under 100 acres, is situated at Newlyn, and possesses one of the snugget and most comfortable homesteads of any farm in the district. The dwelling, which is of brick, with slate roof, is of a very superior description, being large and commodious, with brick kitchen attached. Around the dwelling are planted a large number of valuable ornamental trees, from the nursery of Mr. David Anderson, of Dean, whose generous gifts in the tree line help to beautify many a farmhouse in this district besides the one alluded to. The garden, in which the house is situated, contains a large number of fruit-trees loaded with fruit of every description. It is surrounded with an excellent fence, and kept in first-rate order, and has been planted many years. The farm-yard is enclosed with a rail fence, in which is situated all the requisites for a well-managed farm, and includes a large wooden barn, wagon and cart sheds,

potato-house, stabling, poultry shed, cattle and sheep yards, &c. The implements consist of a reaping-machine, a double and single furrow plough (the former by Kelly & Preston, and the latter by Davidson, of Newlyn), horse hoe, wagon, dray, spring-cart, harrows, &c. The stock consists of three first-class draught horses and one light harness horse for spring-cart, 73 sheep, 3 head of cattle, and several pigs. The farm contains 96½ acres, in six paddocks, 54 acres of which are cultivated as follows: 22 acres of wheat, white Kent and Frampton, good. This land has been fifteen years under cultivation, during which time it has been fallowed three times. 13 acres of oats, Tartarian, a fair crop, and the eleventh off the same land, and one season fallowed. The principal grazing paddock consists of 34 acres, sown down with rye, grass and clover, the greater portion of it last year. There is also 5 acres of peas, and the remainder of the land in root crop, excepting 10 acres of bush land, which is too swampy for cultivation, but excellent for grazing in summer. Mr. Macpherson intends to place a sixth part of the farm under root crop every season, and to follow a proper course of rotary cropping. Some of the best crops grown in the rich chocolate soil of Bullarook have come of this and the adjacent farms.—*Mark Lane Express.*

Wire Fences.

To build an efficient wire fence it is necessary to procure the best quality of wire. Much that is in the market is brittle and worthless. Number nine is the size commonly used. Set the posts one rod apart and put two or three stays on each space. The end posts must necessarily be large, set firmly in the ground, and well braced, as the entire strain from tightening comes on these. Fasten the bottom wire to the posts, eighteen inches from the ground and three wires above ten inches apart.

This would make the fence about four feet high, which is sufficient, as cattle jump wire less readily than boards or rails. In fastening the wire to the posts, care must be taken to drive the staples so as not to bind the wire, as it must draw through them easily to facilitate tightening. For a lever to tighten use a two by four scantling three feet long, with two pins inserted near one end. Wind the wire around these pins until it is tight enough to support the weight of the lever without sagging. Fasten by driving a staple around the wire into the lever at opposite end from pins. One lever will tighten a strand of a section forty rods long, placed upon the middle of it. Wire fence has many advantages for outside enclosures, as it retains no snow drifts to obstruct the roads in winter or soak the fields in spring. The wind has very little effect on it, and in soil that the posts are thrown out by frost they can be driven in again without removing the wire. Cost of wire and staples for four wires will not vary much from thirty-five cents per rod. Wire fence well built, well kept, and snug, is a tidy, good-looking, efficient fence and an ornament to the farm, but it is decidedly the poorest fence in use for a sloven.—*Cor. Farmers' Union.*

Potato Sets and Planting.

I have raised potatoes for seven years past, from sets cut closer each year. Was educated to plant three or four good-sized potatoes in a hill; and of course my prejudices ran in that way. Was persuaded to try the cutting plan, and have followed it ever since. My practice now is to cut as near as possible to single eyes, and plant them in rows three feet apart and 10 or 12 inches in the rows. My success has been greater since adopting this plan than before. What is essential in growing potatoes as good as everything else, is to have the ground in good condition, plant at the right time, and give the necessary attention afterward. For seven years past, from less than half an acre, I have sold each spring about 100 bushels surplus, after using liberally in my family and reserving enough for seed. Three years ago I planted one bushel each of Early Rose and Brigham Seedlings, and dug of each kind 32 bushels of marketable potatoes. Have been in the habit of cutting my seed, as I wanted to plant and have no trouble about its germinating; think, however, it would be better to cut a few days before using, so that they may become glazed. Of all the varieties I have tried I prefer the Early Rose, and this spring will plant none else.—*Cor. Rural New Yorker.*

Grasses and Forage Plants.

Alfalfa.

A Mitchell correspondent sends us the following note respecting the above-named plant:—"In a recent number of your paper I observed an article concerning a grass named 'Alfalfa,' which praised the superiority of the grass over any other kind. The above-named grass being new to me, please inform me where it is generally grown, its habits, mode of culture, &c. By so doing, you will confer a favor on me, and a great many others likewise."

When we state that the common name of the grass referred to is "lucerne," our correspondent will probably be disposed to retract, or at least modify his remark that it is "new" to him, as he is probably familiar with its usual name, though perhaps, like the majority of our farmers, unaccustomed to its cultivation. It is not much grown in this country, from an idea, erroneous as we think, that it is not suited to the climate and soil of Canada. It is extensively grown and highly-prized in England, especially as a green forage plant, but we are inclined to think it has never been thoroughly tested in this country. A farmer in the county of Wellington wrote us the following brief communication respecting it in the summer of 1870:—"It is a capital grass if you can grow it. The climate of this country is, however, too hot. In England it would cut *three times* generally, and would last five or six years, but requires good deep cul'ure, well manuring, and continued mowing in the beginning. I tried it here, and gave it all these chances. It was certainly early timed; but it only came to one cut, and that a poor one. Older soils and cooler season make a difference." We should hardly be disposed to give up the attempt to grow so valuable a forage plant because of one unsatisfactory trial of it. The season might have been an exceptional one, or some condition of soil or culture lacking to make the experiment thoroughly successful. Considering that lucerne is a native of semi-tropical regions, the conclusion ought not to be hastily arrived at that failure was caused by excessive heat. It has a remarkable habit of sending down long tap-roots to a great depth, and for this reason is well-fitted to endure considerable heat and drought. This peculiarity, however, makes it essential to its best performance, that the sub-soil should be deep, rich and easily permeable. It will not succeed in a thin soil, and it languishes in compact clay soils. A good friable loam, with a sub-soil admitting of ready penetration by the growing roots, are indispensable to the best results in the culture of this plant. Wherever a stiff hard-pan exists, as we believe it does in that part of the county of Wellington where the farmer above alluded to resides, a subsoil plough must be used faithfully if lucerne is to be grown successfully. A wet sub-soil is as fatal to it as hard-pan. Rham says of it:—"The only enemies of this plant are a wet sub-soil and a foul surface. The first is often incurable; the latter can be avoided by good cultivation. If the land will not bear to be laid flat without water furrows, it is useless to sow lucerne in it." He recommends "deep ploughing if not trenching," and to secure perfect cleanliness in the soil, prescribes two successive crops of turnips, highly manured, as the most effectual preparation.

Lucerne is cultivated in Chili, and grows wild very luxuriantly in the pampas of Buenos Ayres, where it is called "Alfalfa," a name also given to it commonly, we believe, in California and the Southern States. Its botanical name is *Medicago Sativa*. It is a leguminous plant, and obtains a large proportion of its nutriment from the atmosphere, by means of its abundant, broad-leaved and succulent foliage. Hence, although it yields enormously, it is considered an improving rather than an exhaustive crop. When

the land in which it has been grown is again broken up by the plough, a vast quantity of roots are left to decay in the soil and enrich it. Thus it actually increases the fertility of land for other crops. In one instance on record in the agricultural books, a soil only capable at first of producing a medium crop of wheat, yielded a greatly increased quantity after being laid down to lucerne for a few years, until its roots had enriched the soil.

Mr. Flint, a New England writer, in his "Grasses and Forage Plants," observes: "It is thought by many that lucerne will not endure our northern climates, but I do not think it satisfactorily proved, and I have been somewhat minute in speaking of it, in the hope of inducing more careful experiments on a scale and under circumstances sufficient to determine its relative value for us. I am the more anxious on this point from the fact that I am convinced, after much study and observation of our climate, that we should direct our labors in farming more with reference to the frequent droughts of summer to which we are liable every year, and from which there is no immediate and practicable escape, except in thorough drainage and deep tillage, which most farmers are unwilling to undertake at present."

Rham says: "Where it thrives its growth is so rapid and luxuriant that no other known plant can be compared to it. In good deep loams lucerne is the most profitable of all green crops. When properly managed, the quantity of cattle which can be kept in good condition on an acre of lucerne almost exceeds belief. It is no sooner mown than it pushes out fresh shoots; and wonderful as the growth of clover is, in a field that has been lately mown, that of lucerne is far more rapid. Lucerne will last for many years, shooting its roots—tough and fibrous almost as those of liquorice—downwards for nutriment, until they are altogether out of the reach of drought. In the driest and most sultry weather, when every blade of grass droops for want of moisture, lucerne holds up its stem, fresh and green as in the genial spring."

Hogs are very fond of this plant, and will keep in high condition on it. Small unweaned pigs will begin to bite off and eat the tender shoots, and when weaned, will continue a thrifty growth upon it, until their full size is attained.

The *Sacramento (Cal.) Record* says: "A good fattening breed of hogs will keep in very fine condition for slaughter upon alfalfa with no stronger food. Hogs are even more fond of the roots of alfalfa than the tops, and will, if not prevented, soon destroy a good setting by rooting it up and consuming that which supports them. This may be prevented by putting a ring in the rim of the nasal muscle with which the nose is furnished. This ring may be made of common hay baling wire, but, if the hogs have attained a good size this wire may require to be doubled to prevent it from breaking out. Especially must hogs be rung if they are to be kept on an alfalfa field during the rainy season, for while the ground is saturated with water, it is so easy to get at the roots that they will be sure to take them all out."

If, after perusing the foregoing reply to his note of inquiry, our Mitchell correspondent is disposed to experiment on the culture of this plant, as we sincerely hope he and others will do, it will be easy, in view of what has now been stated, to perceive the necessary mode of cultivation. Seed may be obtained, we presume, without difficulty, from any seedsman whose business is large enough to include the importation of English and other foreign seeds. As the seeds of lucerne are somewhat larger than those of clover, and the plant tillers less, it is necessary to sow more to the acre. It may be sown in the spring with grain crops, like clover, and if the crop is not very large the first year, it will be likely to improve as the roots have time and opportunity to make their way down into "the deep places of the earth."

FEED THE SOIL WELL.—A correspondent of the *Vermont Farmer* says: The Lord loveth a cheerful giver, and so does the soil; and just in proportion to our generosity to it, will it reward us at the harvest time.

Plaster on Grass.

I see many notices of commercial manures, and of almost endless varieties, which I have no practical knowledge of. The phosphates are but little used in this region, and with what results report does not say; and for some reason I am led to suspect that many commercial manures are put into the market mostly for the benefit of the trade, and not of the land. It is but just, however, to acknowledge that so varied are the soils in different regions that what is worthless in one section may be of great value in another. It was never my fortune to realize any benefit to the land or crops from the use of wood ashes, either leached or unleached, yet I know how the best farmers of Massachusetts for 100 years have valued them at fabulous prices. In like manner I have witnessed the value of gypsum or plaster in Eastern and Northern Maine, which leads me to suggest experiments in all grass-growing regions till it is fully known where it may be used with profit. It is certainly a mystery to us all what a bushel of plaster on an acre can do when distributed over the surface, yet the wonderful effect of doubling a crop of grass cannot be disputed. Not all results are alike, but the most worn-out lands are most affected and most strongly improved. I give the facts of a single old barren farm of Alvin Haynes, of Passadumkeag, Penobscot County. The farm, settled 50 years ago, was left 35 years ago for the buildings of a tavern stand on the opposite side of the wide river ($\frac{1}{2}$ mile), since which no more ploughing or manuring has been done. After cutting the hay for the tavern ten years, much of it cut but one-fourth ton to the acre, and they were about to give it up to pasture for what it would fetch at that time. Twenty-five years ago facilities for getting plaster cheap induced a trial. I do not know the amount used, but plaster was cheap and used liberally. The mowing land soon came to yield a ton and more to the acre, and I think has continued that yield now for 25 years. The old fears of exhausting or sapping land by the use of plaster have entirely disappeared in this region. I might give an instance of an old run-out pasture in Fort Fairfield with equally strange results. Nova Scotia plaster comes here where I write for about 25 or 30 dollars per ton, and yet I hear good farmers say they will give 60 dollars if need be. Long-continued experiments in some sections seem to make it probable that the perpetual use of it will make the growth of grass perpetual without our returning to the land the manure that is made from it.—*Cor. Vermont Farmer.*

HOW TO TEST BEETROOT.—The *Memorial de Lille* states that M. Corenwinder, a member of the Agricultural Society of Lille, has made public a very simple method of testing the saccharine richness of beet-root intended for the work of reproduction. The roots are plunged into a trough filled with a saline solution of three degrees of density. The rich roots sink and the poor ones float.

CUT-WORMS.—The *N. Y. Times* says: We have succeeded in greatly reducing the number of this pest by enticing a flock of poultry into the field while it was being ploughed. The fowls followed the plough closely, picking up every cut-worm exposed, and searching every furrow for more. There is no other way of ridding the fields of these vermin but by encouraging their natural enemies. These are crows and blackbirds, which devour the grubs, and skunks and moles, which devour both the grubs and the beetles, of which they are the larvæ. While these creatures are killed or driven off we shall suffer from the depredations of the insects which are their natural prey. To prevent the destruction of the young corn by the cut-worms, to some extent the seed should be rolled in common pine tar and then dried in plaster before it is sown.

"DUTCH CUSS."—A correspondent of the *Maine Farmer*, writing from Long Island, states that the above is the baptismal name applied by the New Jersey farmers to the common white-weed or ox-eye daisy. He then proceeds to detail what a villainous weed it is, how easy it grows, how hard it dies, how fast it spreads, how surely it drives out clover and the grasses, and how useless it is as a fodder plant—hogs even refusing it. Now that the New England and Middle States are under the "cuss" he wants to find some way of deriving benefit from it, as men sometimes think they do from sickness and misfortune of other kinds. Unless farmers have a care this "Dutch cuss" will be casting its evil eye over all their fields. In travelling we have seen patches of it here and there, which, if left undisturbed, will extend over a township. It is an adopted brother to the Canadian thistle, and deserves to be treated the same way.

Horticulture.

EDITOR—D. W. BEADLE, CORRESPONDING MEMBER OF THE
ROYAL HORTICULTURAL SOCIETY, ENGLAND.

Dwarf Apple Trees.

A few years ago a certain portion of the community were wonderfully excited over dwarf apple trees, praising them to the skies, recommending them wherever a tree was to be planted, and giving them the preference to standard trees in all places and under all circumstances. One writer went so far as to say that he would rather have a garden of dwarf apple trees than fifty acres of land for agricultural purposes. One could not read such laudations of those lovely little pets without a feeling of pity, akin to that which we sometimes feel on having a particular friend praised altogether above his merits, and given credit for qualities that he never possessed, knowing, as we all do, that a reaction must and will be the result of such undue praise. Some of these same writers, who had at one time ascribed to these dwarf apple trees every conceivable good quality, seem to have ransacked their vocabulary for harsh epithets to throw at them but a year or two afterwards. That thousands of trees, sold at the time alluded to as dwarf apples, deserved to be condemned as worthless there is no doubt, from the simple fact that every stunted little apple tree, upon whatever stock it might be grown, was palmed off upon the gullible public as a genuine dwarf apple; and there is no doubt but that hundreds of our people will be cheated again this spring with such articles by these brazen-faced tree agents.

Every valuable genuine article is sure to be counterfeited, and surely the dwarf apple tree has had its share of it.

Perhaps it would be well to state before going further what is meant by a genuine dwarf apple tree in this country. Any young tree can be made dwarfish by various kinds of treatment, but the true dwarf apple, about which I am writing, is any variety of apple grafted or budded upon the true Paradise apple stock. And here let me say that I do not mean plants raised from the seed of the Paradise apple, but from layers or cuttings from it. If the stock upon which we graft our intended dwarf apples, shall be grown from the seed of the Paradise apple, somebody will be disappointed, as they will not reproduce themselves true from seed, if grown near where other varieties of apples shall be in flower at the same time.

My opinion then, founded upon twenty-five years experience of dwarf apples worked upon such stock as I have described, is as follows, viz. They are not so well suited to large and profitable orchard culture as standard trees, but for the amateur fruit garden for city, town or village, they will give more satisfaction than any other. Being of slow growth of wood, they produce more fruit spurs, and consequently more fruit, and will be more hardy to resist cold than standard trees. Some varieties will begin to bear when they are not more than two feet high. And it is hard to conceive of a more beautiful object than a dwarf apple tree in full flower. No wonder that Henry Ward Beecher should say, "It is not content with a single bloom for each apple that is to be, but a profusion, a prodigality of blossom there must be. The tree is but a huge banquet. It gives you twenty times as much as there is need for, and evidently because it loves the blossom." And then to see them bearing the immense crop of Red Astracans, Benoms, or Golden Sweetts, reminds one of those little bronze boys we sometimes see crouched with the weight of a large lump upon his shoulders. And when the fruit is ripening, and we wish to pick the first apples of the season, what a pleasure it is to be able

to stand upon the ground instead of climbing, or knocking them from the tree with stick or stone.

Nor are they half so likely to be blown from the tree by the wind as those growing upon the tall tree. And oh, what a pleasure is afforded persons in the various circumstances of life, who shall themselves have planted, but a year or two before, the small garden, in town or city it may be, with these lovely little trees, to pick from them so soon such beautiful fruit.

No fruit is half so delicious as that picked from the trees or vines our own hands have aided in planting.—CHARLES ARNOLD, Paris, Ont.

Restoring Girdled Trees.

One year ago I set out a number of standard pear trees; this winter, while the ground was covered with snow, the rabbits ruined most of them by peeling the bark off for several inches above ground. They are not entirely circled. Is there any way to save them? Would it do to eat them off above the graft, and what would be the proper time?—E. S., Mason Co., W. Va. [If a portion of the bark remains and they are not completely girdled, they will continue to grow, and it would be well to cover the

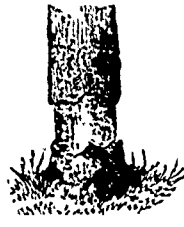


FIG. 1.



FIG. 2.

injured part with grafting wax. If entirely girdled, as in fig. 1, they may be saved by connecting the bark above and below by means of a few twigs sharp-



FIG. 3.

ened like a wedge at each end, and crowded into incisions made with a narrow chisel (figs. 2 and 3). They may then be covered with wax or with embanked soil. If eaten nearly around, one or two of these twigs would be useful. If, however, the trees are small, the best and easiest way would probably be to cut down very early in spring to the lower edge of the girdling, and train up a vigorous shoot for a new stem.]—Cor. Country Gentleman.

Apples for South Monaghan.

Replying to the inquiry of our correspondent, "A. B.," we may say that it is necessary in selecting varieties for this section to pay attention to the hardiness of the tree. The climate may be termed severe, though not equalling in that respect many other parts of the Province, yet quite severe enough to make it very important that the intending planter inquire carefully into the reputation which the varieties he desires to plant may have for being able to withstand extremely cold weather. Among the early varieties, the Red Astracan may be named as very hardy, while it is a good fruit, of fair size and beautiful appearance. Those who were members of the Fruit Growers' Association a few years ago, will be familiar with the appearance of this apple, for a very accurate and well colored picture of it was sent in the report to every member. Following it in time of ripening we may mention the *Duchess of Oldenburgh*, which is even more hardy, very handsome, and valuable, especially for cooking, being sufficiently tart for all culinary purposes. Then comes the *St. Lawrence*, not sufficiently tart for kitchen use, but a good dessert fruit, which is hardly gone before the *Alexander* may be used both for dessert and kitchen, if so large an apple can be ever allowed at dessert. The

Ribstone Pippin will no doubt do well, and no one wishes to pass the winter without the *Snow Apple*; and when that is gone, the *Golden Russet* will keep up the supply until late in the spring.

Attention has been turned to the production of good varieties of long-keeping apples, the trees of which will endure the greatest extremes of cold, and which are sometimes called *Iron-Clads*. Of this class are all the Siberian Crab Apples; and while the finer varieties of these are most excellent for all culinary purposes, making much richer and finer flavored pies and puddings than the other apples, and a few are passable as dessert fruit, yet the size is comparatively so small, and the season of ripening so early, that much labor has been bestowed in the effort to produce trees equally hardy and yet yielding larger fruit and fruit that may be kept until strawberries come. The writer is testing some of these new *Iron-Clad* varieties, and hopes in a few years to be able to give the readers of the CANADA FARMER the benefit of his trial of such varieties as the *Powaukee*, *Walbridge*, *Plumb's Cider*, *Baltimore*, *Allen Russet*, *Ackerman*, *Clark's Orange*, and *Wealthy*, which have acquired some reputation as extremely hardy sorts, in use during the winter.

Evergreens for Windbreaks.

The *Western Rural* says that Norway spruce and white pine are among the fastest growing evergreens, and do well on a variety of soils; that they are of rapid growth, and usually healthy trees. For general planting the *Rural* prefers the Norway spruce, and says the best success in transplanting was when the terminal bud was just beginning to break, as at that time the roots are active and the trees full of sap; and remarks that we should never advise the planting of large trees, especially for growing into windbreaks.

We wish to call the attention of the readers of the CANADA FARMER to these very useful suggestions. Evergreens three feet high are very expensive things of which to make a windbreak, not only in the first cost, but in the cost of handling, transporting, planting, and loss from failure to grow. Young trees cost less, are more likely to live and thrive, and can be trimmed to suit the wishes or necessities of the cultivator. They can be bought from 6 to 9 inches high, once transplanted, direct from the importers, for five dollars per hundred, while three feet trees cost thirty.

PEAR BLIGHT.—Mayor Ludlow has achieved great success in treating diseased fruit trees, pears among the number. His remedy is within the reach of all classes, and consists of boiled linseed oil applied copiously to the affected parts. Some of the cures effected by him have been little less than marvellous.—*Rural Register*.

A FRENCH horticulturist has perceived that, wherever a fruit—a pear, for instance—rested upon some branch or other support beneath it, that fruit always grew to a large size. The support given to the fruit permits the sap vessels of the stem to remain open, and the fruit can receive abundant nourishment. Mr. Thomas Meehan made substantially the same observation some years ago.

PROMOTING FRUITFULNESS.—The *Prairie Farmer* says: "When it is desirable to throw a tree or an orchard into fruiting, because of wood growth being very vigorous without fruit-buds, remedies may be practised. Ceasing cultivation and sowing the ground to clover or grass often works well, but must not be continued too long. Root-pruning, hacking the trees, and pinching or shortening in the young shoots have the same effect, but practically, we should prefer ceasing cultivation and seeding down. Severe summer pruning would perhaps produce such results, but is too severe upon the vitality of the tree. Trees not pruned at all often bear earlier than others."

THE VEGETABLE GARDEN.

Mushroom Growing.

An inquiry comes from Bobcaygeon on the subject of raising mushrooms, and we are requested to give full particulars, including the kind of soil best adapted to the growth of mushrooms. The growing of mushrooms is a very easy and simple process, exceedingly simple and easy when one knows how, and yet requiring just that peculiar knowledge and skill which can be acquired only by patient practice, joined to intelligent observation.

The first requirement is a suitable place in which to grow them. The best place is in a cellar where the temperature never falls below 40° Fahrenheit, and never rises above 60°, and which can be made perfectly dark. Next to a cellar would be some vacant out-building or shed, well shaded from the sun and protected from searching winds, where the temperature can be maintained without much fluctuation day and night. We have never known any one attempt growing them in the open air in this climate, but at a favorable season of the year it might be done by making the beds on the north side of some building and protecting them from rains.

The second requirement is a good supply of horse droppings from working horses that are liberally fed with grain and hay. The droppings from those that are fed on roots, grass, bran and other soft food are not suitable. This should be gathered fresh every day, with as little litter as possible, and free from sticks, stones and especially any bits of iron. These droppings should be placed under shelter in a heap not more than four feet high, and of such length and width as may suit the convenience. They should not be allowed to heat violently, and to prevent this it will be necessary to turn the heap frequently, taking care when turning to throw the outside portions into the centre, so that the whole may be evenly fermented. The manure should not be allowed to become wet by rain or snow. When a sufficient quantity has been accumulated to form a bed say four feet wide, two high, and twelve long, it may be taken to the cellar, out-house or shed, and there carefully built up as one would build a hot-bed. It should be packed firmly, tramping each layer, and leaving the surface level. Layers of six inches in thickness will be about right to place on at a time. In about a week the bed will probably be ready for planting. And here is the critical point. Here is required that peculiar knowledge which only experience can give, for if the manure be not in the proper condition to receive the spawn, it will be of no use to plant it. It has been well said that "when the manure has become odorless, is of a brownish color, binds well, is soft, and on being pressed does not give out any water," then it is in the right condition for receiving the spawn. If it does not bind well, or is wet, it is not in a proper state. If it does not bind it may be moistened a little, the bed made over, turning it thoroughly, when it will heat again, and in a few days be ready to receive the spawn. If, however, the manure be wet, it will not be likely to be ever of any use. Care must be taken not to spawn the bed while the fermentation is too active and the heat too great. The experienced grower can tell by thrusting his fingers into the bed, the novice may know by using a thermometer,—not putting in the spawn where, after inserting the bulb into a hole in the bed, the mercury rises above 80°, yet not waiting for the bed to cool below 75°.

Spawn can be had of all our large seedsmen. This should be broken into pieces about as large as an ordinary hen's egg, and the pieces introduced into holes made in the bed about two and a half inches deep, and then covered with the manure taken out in making the opening for the reception of the spawn. These holes may be made in rows across the bed, making the rows about eight inches apart, and the holes eight inches apart in the row, but placing the

holes in one row opposite the spaces in the next row. After the bed has been spawned it will be necessary to cover it three or four inches thick with clean straw in order to keep out the light, unless the bed be in a cellar or tight shed that can be made quite dark. When the spawn is received from the seedsmen it will be very dry. This is as it should be in order to preserve its vitality. But the bed will be filled with spawn more quickly, or, in other words, the spawn will grow more rapidly after being planted, if it is allowed to lie in a damp place, not wet, as on the bottom of a damp cellar, for a few days before it is planted.

In from four to six days after putting in the spawn, examine the bed, to see if it be spreading in the manure. If it is, fine white threads will be seen running in every direction from the inserted piece into the surrounding manure. If, instead of finding an increase of white threads, the piece you put in has become black, take it out and put in a fresh piece in a new hole near the old one.

After the spawn has begun to spread itself well through the bed, it will be necessary to remove the straw covering if one has been needed, and put on a layer of fine earth. The best is sandy loam from an old pasture field. Let it be finely pulverized, and free from clods or lumps of any kind. It should be spread on very evenly an inch or two in thickness and pressed down firmly with the back of the spade. Now cover again, if necessary to exclude the light, with clean straw. In about a month the mushrooms may be expected to make their appearance. Gather them when full grown by a gentle twist, drawing them out of the ground, and filling up the hole with a little fresh soil. A good bed may be expected to continue in bearing about three months.

In our climate, where the heat in summer is so great and the cold in winter so severe, by far the best place for growing mushrooms is in the cellar. Yet they may be grown under sheds in moderate weather, though during the heat of summer it will be found necessary to give the beds a moderate supply of tepid water every few days. In cellars, where the evaporation is much less and the temperature nearly uniform, beds will continue longer in bearing and require watering very seldom.

Asparagus Beds.

The use of asparagus as an edible plant is rapidly on the increase in this country. A large proportion of our farmers knew of it a few years ago only as an ornament for trimming the rooms of the house, or rather as a useful perch to attract flies from the mirror. As used upon the tables of hotels, it served more as a garnish than as a relishable article of food, owing to the foolish notion that it must be cut mostly under ground in order that it may be blanched, which rendered its outside coatings too tough for mastication. But we are getting over that notion, and learning that only when the stem has been submitted to the marvellous alchemy of sunlight is it really palatable food. We learned that lesson more than a dozen years since, and found that when that portion of the stem, growing above ground, is cut before the head begins to unfold into leaves, and cooked and served in about the same manner that green peas should be, it forms a delicious greens.

In giving directions for growing asparagus it may be well to make two divisions of the subject,—the growing of the plants, and the growing of the edible stem. To raise the plants, make good garden soil rich and mellow, and sow the seed in drills fifteen inches wide and two inches deep. If the seed is sown in rich ground, and well cultivated, the plants will do to transplant, when a year old, but under ordinary cultivation they are better when two years old.

It is well to select, when practicable, a deep, strong, sandy loam, work it up deep and fine, and incorporate with the soil an abundance of fine manure, and you ought to do about the same thing if you expect to raise large crops of any garden vegetable. The plantation may all be in one bed, or may be divided up into beds about five feet wide, with alleys

two and a-half feet wide between them. In the former case you would expect to walk upon the bed in hoeing, weeding, and cutting, while in the latter you would keep in the walks, and reach to the middle. With the wide beds, it would be well to plant in rows from two to two and a-half feet apart; with the narrow you could plant one row through the middle, and one within a foot of each side.

The trenches for planting the roots should be dug deep enough to admit the crown of the roots being covered three to four inches, so that the surface can be dug over two or three inches deep every spring. The plants should be set about one foot apart in the row, as they will spread enough in a few years to make a compact mass of roots all over the bed. The first year the plants should be well cultivated, kept clean, and allowed to grow pretty much at will, until they show a disposition to go to seed, when they should be cut off while in bloom. When they have completed their growth the stems should be cut down and raked off, and the bed covered with a coating of manure, which should be dug in the next spring. Contrary to the common rule, we have practised cutting some for the table the next spring after planting, but not much until the second spring, when it is usually strong enough to cut freely. It is still an unsettled question, whether salt is a special fertilizer for the asparagus. The notion arose from the fact that it is found growing without cultivation, near the sea. We have known beds to flourish without it, yet a light dressing will do no harm, and may do good.—*Rural Home.*

To Destroy the Cabbage Worm.

Thinking, perhaps, the numerous readers of your journal would like to hear any suggestion relative to the destruction of the worm and louse upon the cabbage or turnip plant, I make the following suggestions as the result of experiments the past year: Being a full developed tobacco user, and knowing the deleterious effects the vile weed has on the human system, and the offensive perfume an old pipe in a man's vest pocket has on all society, or his breath has to every one that comes in contact with him, I began to study, as I had been defied in my gardens with these pests for the last four years. After testing everything that I could hear was a remedy for the worm and louse, I adopted the following, which with me has proved "a sure pop" remedy, with but little trouble or expense.



My process is this. I had a tin tube made 2 feet long, with a hole through it $\frac{3}{8}$ of an inch; then I add to this tube a piece 6 inches long, with a $\frac{3}{8}$ inch hole in this: fill the large tube one quarter full of the strongest smoking tobacco, made dry; put in a live coal, and then I am prepared for business. By blowing into the large tube, forcing the smoke through the $\frac{3}{8}$ tube amongst the leaves of the plant, the louse will give way to this treatment at once, and the smoke has a penetrating effect on the louse, so as to make it very offensive to a second attack of the pests. If any one does not wish to get their face quite so near the tobacco as to blow in the tube, a common hand-bellows can be inserted in the tube and smoke forced out very rapidly.

The way to do with this remedy is to go over the plants before, or as soon as you see places eaten through the leaves; then I think it a sure thing. I give a sketch of the form of the instrument in question—N. B. M., Locust Grove Farm, Saratoga Springs, N. Y.—*Rural New Yorker.*

THERE was a great stir, says *Punch*, in our garden the other day. The potatoes were ready to jump out of their skins. The beet turned red to its very roots. The celery lost their heads, and the cabbages their hearts. The peas spat their pods with excitement. The asparagus could with difficulty be kept in its bed. The parsley curled itself up in a corner. The cucumber alone maintained its habitual coolness. The cause of all this commotion was the presence of a noted vegetarian. The potatoes never took their eyes off him.

THE FLOWER GARDEN.

The Botany of the Daisy.

The daisy belongs to the immense family of the Composite, a family which contains one-tenth of the flowering plants of the world, and of which nearly 10,000 species are recorded. Rousseau does not mention one point which I wish to describe to you as I know few points in botany more beautiful than the arrangement by which the flower is fertilized. In the centre of each little flower is the style, surrounded closely by the anthers. The end of the style is divided, but, as long as it remains below among the anthers, the two lips are closed. The anthers are covered, more or less, with pollen; the style has its outside surface bristling with stiff hairs. In this condition it would be impossible for the pollen to reach the interior (stigmatic) surfaces of the divided style, but the style rises, and as it rises, it brushes off the pollen from the anthers around it. Its lips are closed till it has risen well above the whole flower, and left the anthers below; then it opens, showing its broad stigmatic surface to receive the pollen from other flowers, and distribute the pollen it has brushed off, not to itself (which it could not do), but to other flowers around it.

By this provision no flower fertilizes itself, and those of you who are acquainted with Darwin's writings will know how necessary this provision is in penetrating flowers. The daisy not only produces double flowers, but also the curious profliferous flower called Hen and Chickens, or Childing Daisies, or Jackknives on Horseback. These are botanically very interesting flowers. It is a well known fact in botany, that all parts of a plant—root, stem, flowers, and their parts, thorns, fruits, and even the seeds are only different forms of leaves, and are all interchangeable, and the Hen and Chickens Daisy is a good proof of it. Underneath the flower-head of the daisy is a green cushion, composed of bracts, in the Hen and Chickens Daisy, some of these bracts assume the form of flowers, and are the chickens. If the plant is neglected, or does not like its soil, the chickens again become bracts. The only other point in the botany of the daisy that occurs to me is its geographical range. The old books are not far wrong when they say "it groweth everywhere." It does not, however, grow in the tropics. In Europe it is everywhere, from Iceland to the extreme south, though not abundant in the south-easterly parts. It is found in North America very sparingly, and not at all in the United States. It is also by no means fastidious in its choice of position—by the river-side or on the mountain top it seems equally at home, though it somewhat varies according to its situation, but its most chosen habitat seems to be a well kept lawn. There it luxuriates, and decks the scythe and the mowing machine. It has been asserted that it disappears when the ground is fed by sheep, and again appears when the sheep are removed, but this requires confirmation. Yet it does not lend itself readily to gardening purposes. It is one of those

Flowers worthy of Paradise, which not nice art
In beds and curious knots, but Nature's boon
Pours forth profuse on hill and dale, and plain,
Both where the morning sun first warms the smote
The open field, and where the upland shade
Lays down the noontide bowers.

Par. Lost, iv. 210.

Under cultivation it becomes capricious, the sorts degenerate and require much care to keep them true. As to its time of flowering, it is commonly considered a spring and summer flower, but I think one of its chief charms is that there is scarcely a day in the whole year in which you might not find a daisy in flower.—*The Garden.*

Gladiolus Blooming from Seed.

I have this season had a gladiolus seedling bloom the first season from seed. In ordinary practice three years are required to bring seedlings up to flowering size; and hitherto I have felt a gratification when I have so advanced their growth as to obtain flowers the second year. Ever since learning from *Le Jardinier Français*, of Carriere, that the French by use of bottom heat obtain bloom the first year, it has been my endeavor to accomplish the same feat, but our short seasons have, until this year, baffled me. Last spring I sowed in a box with a slatted bottom a small package of seed I had saved from my choicest varieties of gladiolus, and placed the box on my hot-bed, where, after the glass was removed, it was permitted to remain all summer. Some of the plants which came up grew to considerable size, and late in the season one of these showed flower buds. Removing the box to a sunny place beyond the reach of the autumn frosts, I was soon delighted with

flowers of exquisite delicacy and beauty. It was evidently a seedling of *Madame Desportes*, and had inherited, besides the beauty of that variety, its strong habit of growth as well.

I will add, by the way, that raising gladiolus seedlings offers an inviting field for experiment. Some have thought that our bright skies and hot summers, corresponding so much more nearly with the climate of the Cape, the native habitat of these plants, than does the climate of northern Europe, where were produced the most of our named varieties, lend additional brilliancy to the seedlings grown here. For varieties which excel the costliest French and Belgian importations are each year produced in abundance; so freely, indeed, that it is not possible to name them all or preserve them distinct. The method which I have suggested above would enable many an amateur or lady of limited means to multiply in a short time, and with but little pains, the few varieties already at hand, and procured, it may be, with much difficulty and at some sacrifice.—*Cor. Vermont Farmer.*

Sowing Flower Seeds.

Seedsmen no doubt sell bad seeds sometimes; but this is extremely rare. It may be that they are no more honest than other people, but after all the world is not half as dishonest as people are apt to believe. But there is little occasion for seedsmen to sell bad seeds. If an article is new or rare there is seldom any more in the market than is needed, and there is no old left on hand to sell.

But granting that once in a while the seed may be bad, in the vast majority of failures of seed to grow, it is from the seeds either rotting or getting too dry. It is rare indeed that seeds, especially of the smaller kinds, are not put in the ground too deeply. Seeds need air and moisture to vegetate. Deprived of air they will not grow. The common Rag weed seed simply ploughed down, perhaps not more than four inches, remains good for years until ploughed up again. If seeds can be kept regularly moist they will grow better entirely on the surface than beneath. We have to put them a little under in order to keep them moist. The soil in which seeds are to be sown should therefore be powdered fine, because powdered soil keeps moist longer and better than a clotty one. Any one may see this. Have a piece of ground dug roughly, and let it lie a few days to dry, and then walk across it. It will be found next morning that where the ground was powdered by the footsteps the surface is quite damp. Very fine seeds are best sown on the surface and then beaten firmly in by the back of the trowel. Most annual seeds may be sown in this way. They usually soon sprout after sowing and there is moisture enough in this beaten earth to keep them going till they do; and then they are near the surface so as to get the air, according to the requirements of good gardening.—*Maryland Farmer.*

Hardy Azaleas and Rhododendrons.

Many of the wealthy gentlemen who have rural estates wish to go into the culture of the improved varieties of Belgian azaleas and rhododendrons. Some who have tried them have failed by their very careful preparations for the plants. All the preparation required is to dig the holes a foot deep, and if the soil is a stiff loam, mix with it sharp sand and leaf mould, or rotted dung, just enough to make the soil friable, pulverize well, set the plants and fill up with the mixture. If the soil is a light loam, just mix a little leaf mould or rotten manure with it. The same treatment will suit both genus. Mr David Landreth, the great seedsman, grows hundreds of both genus, in sunshine and in shade of trees, and gives them the same care as other common shrubs, but mulches them the first year with leaf mould and sawdust; they all flourish and bloom profusely. No deciduous shrubs can equal the Belgian azaleas in the beauty of their blossoms of numerous colors; and no evergreen shrubs can compare with the improved rhododendrons in their lovely foliage and blossoms of splendor of all shades, from pure white to deep crimson and purple. Both genus may be set in groups upon a lawn, as we plant flower-beds, either in full sunshine or under the shade of trees. Put tree leaves over their roots the first winter after being set out. Plant in April or May.—*Telegraph.*

A SINGULAR PLANT.—Under the name of "Jaquinia smaiaghina," M. Andre describes, in a recent number of the *Illustration Horticole*, a plant grown in M. Linden's nursery at Brussels, with blackish-green foliage, and large, handsome emerald-green roseaceous flowers. M. Andre speaks of it as a most effective plant, possessing a more modest beauty than even that of the violet.—*The Garden.*

THE WINDOW GARDEN.

Watering Window Flowers.

Most people are fond of growing a few flowers at their windows; but almost every one is puzzled as to the number of times they should be watered in a day. Suppose one purchases a few flowers—say scarlet Thom Thumb Geraniums, Petunias, Heliotropes, Fuchsias, and similar plants, one naturally inquires how often they should be watered. The answer to this question will be "do not water them till they are dry," or "till they require it." The plants are sent home, placed in the window, or wherever they are intended to stand; and, although the drooping points of their branches soon indicate aridity at the roots, the balls of earth are not considered quite dry; therefore amidst considerable alarm, there is some hope entertained that the safety of the plants will be best insured by a scrupulous adherence to the directions. Another day is allowed to pass, and the soil at last is as dry as a crust. "Now," soliloquizes the anxious cultivator, "I surely may water them." The pots are accordingly charged with water, which the dryness of the soil does not permit to percolate till after some considerable time. The shoots do not regain their firmness, the leaves turn no fresher, and everything testifies, in the most unmistakable manner, that the remedial measure has been withheld till it is "too late." Undoubtedly it is wrong to keep such plants as those mentioned continually soaking in water by means of saucers, but the soil in which plants grow should never be allowed to get quite dry. The safest condition for such plants is that of moisture, though in winter they require less water than in summer. Ferns, even the deciduous species, I keep moist. Such treatment I have found to insure success, and if we look at the kinds we have growing in our own country, we find they are moister at the root in winter than in summer. Though the soil in which Ferns are grown, however, should always be kept damp, great attention should be paid to the state of the drainage.—*The Garden.*

THE CALLA LILY.—We do not know of a more beautiful winter blooming plant than the old-fashioned Calla Lily. It succeeds so well in the window, needing very little care, excepting an abundance of water and an occasional dusting of the leaves, that we recommend every lover of flowers to try it. A writer in our Detroit namesake gives a very sensible summing up of the requisite methods of culture: 1. After blooming, dry off very slowly but thoroughly; 2. Keep the roots simply from drying out entirely during the seasons of rest. 3. Start slowly in light rich soil with little water at first, increasing as growth increases. 4. Plunge, if possible, in stagnant water until wanted for the house, or there is danger of frost. 5. Repot in rich mucky soil. 6. Give plenty of water while the plants are growing and blooming. 7. Give plenty of light and sunshine.

EARLY VIOLETS.—To have early violets for bouquets and baskets, nail four boards together and place a sash upon them. Form a slight bank of fresh stable manure, covered by some good compost, and plant in it a few sods of violets. It will not be many days before you can cut plenty of these "wee modest flowers." They will not endure a strong heat, nor do they enjoy a dry air. They succeed best with the temperature merely high enough to encourage vegetation, and plenty of moisture, but not enough to cause rot.

A NEW CANNA.—The Canna forms one of our finest so-called sub-tropical plants for massing on the lawn, and in consequence the hybridizers have been increasing the number of the distinct varieties in a really wonderful manner. A floriculturist of Lyons, France, has succeeded in obtaining a rare novelty with beautiful double flowers of a bright red color. This will undoubtedly form the nucleus of a race of double-flowering kinds, destined to prove exceedingly popular in this country.

WINDOW PLANTS.—For small flowering plants for window decoration in winter there is nothing more suitable than the Persian Cyclamen, Chinese Primrose, Lachenalia, Crocus, and Snowdrops, all of which sport into a great variety of colors, and are easily managed. Whenever the frost chances to be out of the ground dig up a root of the *Dicentra* (improperly called *Dielytra spectabilis*); place it in a box or large pot, and set it in your warm sunny window. It will be, in a short time the crowning glory of the room.

The Dairy.

The Chemistry of Milk.

Milk is one of the most complex organic compounds with which chemists are acquainted.

When fresh drawn it appears to the naked eye as a homogeneous white opaque liquid. It has a sweetish slightly alkaline taste, with an unctuous feel.

The chemist divides it into four proximate principles: water, caseine, butter, sugar, with certain soluble salts, chiefly phosphates and chlorides, and some free soda. It has a specific gravity of about 1.030.

The microscope shows milk to be a colorless limpid liquid, having suspended in it minute opaque white, rounded bodies, to which its peculiar white opacity is due. These bodies are found to be shut in alabumoid transparent sacks, filled with an oily or fatty opaque substance—both sack and contents being insoluble in the liquid base. These are called milk globules, and vary in size from a mere point to that of one to two-thousandths of an inch in diameter. They also vary much in number, in different samples of milk, depending on numerous circumstances. When the fresh milk is allowed to remain at rest for some time, from their lightness they rise to the surface, and constitute cream. When the covering, or sack of the globules in the cream are mechanically ruptured so as to allow of the free escape of their oily contents, it readily runs together into a semi solid mass called butter. It is almost impossible, however, to get all the fat globules of the milk to rise in the form of cream, on account of their entanglement in the substance of the milk. As a general rule, not more than one-tenth of the whole in the milk will thus separate, while the skimmed milk often retains one-half of the milk globules; this, however, depends much on the condition of the milk—the longer it is kept sweet and at rest, the more will rise, but if curdled from becoming sour the less—hence the great advantage in butter making, of having clean, cool cellars, especially in warm weather. In many countries, on this account, the whole milk is churned. This plan, to a great extent, is practised in Great Britain, and in many portions of the European continent.

Butter, then, is the collected mass of these ruptured, fatty globules, freed from other substances, especially caseine. It consists chiefly of a solid fat, and a liquid oil in the proportion, by weight, of about sixty-eight per cent. of the former, and thirty-two of the latter. The percentage of butter in fresh drawn milk is subject to great variation, depending much on the constitutional build of the cow, her health, feed, care, and season of the year, etc. Good, healthy, fresh milk ought to yield to the chemist from three to three and a-half per cent. by weight of butter; yet I have found in Cleveland market, in that which was reputed "fresh, rich milk," to contain on analysis less than two per cent. by weight of butter. The real value of fresh milk can only be estimated by the percentage of its contained butter. But, alas! the denizens of cities, depending for their supply of this necessary article upon milk dealers, especially "middlemen," know but little practically of real good fresh milk.

A common source of impoverished milk in market, and one that cannot really be called adulterating it, is that of removing the "strippings" from the milking. It is well known to all dairymen that that portion first drawn from the cow at a milking is not as rich in butter as the last portion; and removing that portion into separate vessels aside from the general milking, is robbing it of its richest portion.

New, fresh butter has but little odor, but often after a little time it becomes rancid. This is caused from the imperfect removal of its contained caseine. The caseine thus left in a little time reacts like an alkali (or as potash on fat in soap-making) on the fat of the butter, effecting analogous changes, resulting in the formation of glycerine, and several volatile, disagreeable gaseous acids, offensive alike to taste and smell. This may be in a great measure prevented by either thoroughly removing the caseine, or mixing it with salt sufficient to prevent decomposition. This rancidity is often erroneously attributed to buttermilk. Rancid butter cannot be rendered sweet, although many attempts have been made in that direction—but not by any one who understood the principles of organic chemistry.

The mechanical operation of buttermaking consists generally in first collecting the cream, rupturing the

milk globules by churning, and allowing their contents to adhere together into a semi-solid mass, and then carefully removing all the caseine, and buttermilk, which always contains more or less caseine; and if intended for future use, adding to it salt sufficient to prevent decomposition.

Milk sugar is easiest obtained in a separate state from the whey by gentle evaporation, and subsequent washing. It differs somewhat from cane sugar, being less soluble and less sweet, resembling in these points more closely that of glucose, or grape sugar. It is susceptible of fermentation under favorable circumstances. This fermentation, however, is not the vinous like that of cane and grape sugar, but the lactic. Hence in the presence of caseine it rapidly passes into lactic acid, which causes milk to become sour; and warmth favors this change. Unlike cane and grape sugar, it does not undergo these changes by the presence of yeast even when aided by heat.

Caseine or Cheese.

The presence of free soda in milk retains its caseine in solution, but when this soda is fully neutralized by an acid, it becomes insoluble, forming curd, which in its coagulation entangles with it the fat globules and leaving behind a clear yellow liquid called whey, holding in solution the milk sugar.

Cheese-making is simply curdling the milk, which at the same time includes with it nearly all its butter. This process is generally, first heating the milk after being cooled from its animal heat, to the temperature of eighty-five to ninety degrees Fah., and curdling it by means of rennet, which is the fattened and oiled inner lining membrane of a calf's stomach. It is supposed to add to the value of the rennet to steep it in whey, rather than water; after its addition the milk is kept quiet until the whole is completely coagulated. The curd is separated from the whey, salted, and subsequently pressed into cheese, and placed in a cool, well-ventilated room to ripen. Although rennet has been used from time immemorial in cheese-making, yet no satisfactory chemical explanation has yet been given of its action on milk.

The richness of cheese depends on its contained butter. While the flavor is not so easy of explanation, a visit to any dairy will hardly find two cheeses of the same flavor, although their method of manufacture has evidently been identical, showing that neither the quality of the milk nor the mode of milking are the only agents in the development of the flavor, or aroma.

Much depends on the process of "ripening" The chemistry of ripening is the action of the caseine on the butter, which in the generation of glycerine, and volatile acids, also at the same time evolves certain ethers through the substance of the cheese, and when these are held in control by turning, rubbing with salt, etc., these ethereal compounds are retained, but are soon dissipated when a cut surface is freely exposed to the air. Much care is necessary then in the curing of cheese if a good aroma is desirable.

The market value of cheese depends much on the richness of the milk. Cheese-making and buttermaking, for obvious reasons, ought not to be united in the same dairy at the same time.

The percentage of caseine in milk varies very much. In fresh, sweet milk it ranges from three and one-half to six and one-half per cent. by weight. Caseine is the only nitrogenized substance in milk and is regarded as being highly nutritious, but at the same time is also very indigestible to most persons.

The aqueous portion of milk, unlike the other parts I have described, is very uniform in quantity, seldom varying, under any circumstances, more than one or two per cent. by weight, in a full milking of freshly drawn milk. It is easily separated from the other constituents either by evaporation or distillation.

The following is an analysis of an average specimen of good fresh milk—from a healthy cow belonging to myself:—

Sp gr. 1.0277.	
Water.....	\$6.20
Ash, or salts.....	0.90
Caseine.....	6.20
Butter.....	3.40
Sugar.....	3.30
	100.00

I found but little chemical difference between the morning and evening milking.—J. Lang Cassels, M. D., Analytical Chemist, Cleveland, O.

THE Illinois Legislature has just passed a law which provides that whoever adulterates any milk with water, chalk, or other substance, or sells such milk, shall be confined in the county goal for a period not exceeding one year, or fined in a sum not exceeding \$500.

The New "Patent" Butter.

The public has been very much exercised this week over news from Washington, concerning a California invention, in the shape of a churn, with which it was proposed to perform certain miracles in the way of butter making. The inventor, one Budd Smith, converted milk into butter in a few seconds, without the aid of any mixture, and with a loss of only a small quantity of water. One gallon of milk (which weighs a little more than eight pounds) was said to have been converted into 7½ pounds of butter in 30 seconds. The manner in which this was performed was kept a secret by the inventor; but the transformation of milk into butter was believed to be caused "by galvanic action," and that there was a chemical combination of the different parts of the milk. It is rather remarkable, that whenever any process which develops unaccountable effects is brought before the public, either electricity or galvanism has to take the blame of the unaccountable results. They are, however, convenient "scape goats," as there is something fascinating and mysterious in the mere name of electricity to the common mind. "Chemical combination of the different parts" is another convenient phrase, which not only mystifies the general public, but leads them to think that the writer is a chemist, which he is not, or he would not use so vague an expression.

The inventor of the churn referred to, constructs it in three different parts, one fitting into the other, composed of a metallic combination which is kept a secret. The dispatch detailing the statements to which we refer, also stated that the "scientists of the patent office confessed themselves puzzled" and had not yet granted a patent. It is said the inventor has already disposed of rights (before he had any himself) to different parties for large sums, varying from \$50,000 to \$80,000, and was only waiting for his patent to dispose of others. Senators and other distinguished men were invited to see the churn in operation, and correspondents were writing about it all over the country. One scientific man, in examining it, thought the product, instead of being butter, must be a kind of soap, and he was probably right, as we shall endeavor to show.

We have met several parties in this city who had unbounded faith in the churn, the butter and the inventor. They had turned the handle of the churn themselves and made the butter, afterwards eating it—the butter, not the churn. They pronounced the product excellent butter, with no strange taste and no peculiar appearance. We had grave doubts on the subject, and questioned them closely, especially as to whether any substance was put into the churn. One of them had bought the milk at a corner grocery himself, poured it into the churn and made the butter. On consideration, we concluded that if the churn could make butter out of corner grocery milk it was a wonderful invention indeed, and might, with slight improvements, be able to make butter out of pure water.

The plan of making a pound of butter from a quart of milk is no new thing. Receipts for doing so were sold to confiding farmers years ago, and companies were formed for making it. In this connection the receipt referred to may be interesting. Take four ounces pulverized alum, half an ounce pulverized gum-arabic, 50 grains pepsin, mixed well together, and preserve in a bottle. One pint of good milk requires only one-third of a teaspoonful of this powder. This is put in with the yolk of one fresh egg for every pint of milk and then it is churned, and the result will be half a pound of a mixture of butter and caseine for every pint of milk. In order to make a whole pound of butter for each pint of milk, half a pound of good butter for every pint is smuggled into the churn, and the resulting butter will be not only greater in quantity but also better in quality. Butter made by this means is not fatty; it will not stick together, as good butter does; it has not the proper greasy, smooth look, but a dry and crumbly appearance. Of course it is half cheese.

This is only one plan of the many offered to the public. When, however, it is stated that a pound of butter can be made from a pint of milk by simple churning, no ingredients being used, the statements can be taken with a large grain of salt. Milk contains: caseine, 3.74 parts; butter, 4.43; milk-sugar, 4.83; water, 86.43, and a saline matter, 0.57. To make butter, therefore, from pure milk, and make bulk for bulk, a miracle must be performed, and water turned into butter.

Butter can be increased in weight or bulk as lard is adulterated. In adulterating lard, from 15 to 40 per cent. of pure water is *saponified* and made into a stiff mass, which as it is incorporated with the lard, is put on the market as lard. It only requires some oil or fat, either animal or vegetable, combined with water

and a small percentage of soda. By this means a large percentage of water can be made into butter or anything else, but it is more soap than butter. Any common oil can be used, or the butter particles in milk will answer the same purpose. This new patent churn was very probably made to effect its object by some such means as this. If two or three per cent of common soda was added to the milk, or placed in the churn, it would saponify the mass, which would naturally take the color of the fatty matter, and in this case give it the color of butter. There is no important increase of real butter in the churn, although the watery mass which looks like real butter weighs more. If the mass is put into a dish and heated, it appears to us that the true butter will separate from the bulk, or water with which it is blended.

It is stated in dispatches to the dailies that the peculiarities of the churn referred to, and certain things in connection with the sale of rights, etc., led to a close investigation, when it was ascertained that the substance which they called butter was produced by placing one pound of butter and the yolk of two eggs into each gallon of milk, and washing the inside of the churn with nitrate of soda. The milk is caused to coagulate into a substance resembling butter by the churning process, and the hot and cold bath into which the churn is successively passed. If so, the whole thing is a fraud. It was the ingredients, not the churn, on which they had to get a patent, and probably these ingredients were already well known. At all events, our dairymen need not tremble lest their business should fall into the hands of the Spring Valley Water Company, any more than they need fear that oleomargarine, or "bull butter" will supersede the old-fashioned original article. Whether Smith makes his butter from one ingredient or another, matters very little, as none of these artificial butters are much better than other artificial products, when compared with the original article.

Directions for Packing Roll Butter.

The following circular is from a produce merchant in Montreal, and as the directions are valuable, we reprint it:

The season having arrived for roll butter, I beg to offer the following directions to my friends, which, if fully complied with, will enable them to realize the highest market quotations for their butter, instead of the lowest, as is most generally the case, which is not the fault of the consignee. There is nothing so unsalable as badly packed roll butter; but on the contrary, if packed nicely, it sells readily, and generally from two to five cents per pound more than the same quality packed solid in firkins.

Use none but the very best new barrels, and be sure that they are not burnt or dirty inside. The end you intend for the head you should turn down; then take out the bottom head and cut a piece of fine white muslin, the size of the head, and place it on the bottom of the head of the barrel (which will be the head when opened). Commence to pack your finest and smallest rolls first, being sure to pack each roll on its smallest end. Be careful and select rolls that will pack snug, so that there will be no space for the rolls to shake about. Continue packing in this way until the barrel is almost full, then shake the barrel well (to settle the rolls), and then fill it as snug as possible. In packing the last layer, pack the rolls on their ends if possible, but if there is not room, it will not matter if they are packed on their sides, if they will pack snug and fill the barrel full. The great object is to have the rolls packed close and tight, so that they will not shake about and break.

Each roll must be wrapped in a piece of white muslin or cheese capping; be sure and have it large enough to cover the roll entirely. The muslin should be soaked in strong brine before using, and put on the roll wet. It is impossible to send rolls to market in good order without wrapping them in muslin; and no matter what the muslin may cost, it will more than pay the cost of the increased prices the rolls, thus packed, will bring.

Before heading the barrel up, pour on two quarts of strong pickle. Cover the last layer with a piece of muslin the same as you do on your head.

Nail up the barrel well, being sure to drive three nails in each hoop. Then turn the barrel over two or three times, so as to let the brine you have poured work in between the rolls.

Mark the top in plain letters "roll butter," also the gross weight, tare of the barrel, and address of the party to whom you send it, and the initials of the shipper.

Rolls should be made in an oblong shape, and not weigh over two to four pounds.

Introduction of Dairy Cattle into America.

Mr. E. Sturtevant has been at the trouble of compiling for the *Country Gentleman* the following data relating to the introduction of cattle into the United States previous to the present century. It will be interesting to many of our readers:—

1493—A bull and several cows from Spain, by Columbus on his second voyage.

1518—The Baron de Levy made an abortive attempt at settlement on Sable Island, where the cattle left by him increased and multiplied.

1553—The Portuguese took cattle to Newfoundland and Nova Scotia.

1604—Cattle were brought into Acadia by L'Escarlot, a French lawyer.

1608—The French extended their settlement into Canada, and soon after introduced various animals.

1609—The first cattle introduced into Virginia were previous to 1609.

1610—Sir Ralph Lam brought cows to Virginia from the West Indies.

1614—The Dutch brought cattle into New York from Holland. They were black and white, and red and white, and noted as good milkers.

1624—Edward Winslow imported three heifers and a bull into Plymouth Colony.

1624—Cattle imported into New Netherlands, from the Texel in Holland, by the Dutch West India Company.

1626—Twelve cows were sent to Cape Ann.

1627—Cattle were imported into Delaware by the Swedes.

1629—Thirty cows were sent to Cape Ann. Sixty or seventy oxen and cows imported under the direction of Francis Higginson, formerly of Leicestershire, for the "Governor and Company of the Massachusetts Bay in New England."

1631 or 1632—Captain John Mason introduced cattle from Denmark into New Hampshire. These cattle were of a large size, and of a yellowish color. This breed remained pure and unmixed near Agamenticus, in Maine, down to about the year 1820.

1670—Cattle brought into Carolina from England by Wm. Soale, to old Charleston, on the south side of Ashley River.

1690—The Indians on the Red River in Louisiana possessed cattle.

1711—Sir Thomas Gates brought into Jamestown, Va., 100 head from Devonshire and Hertfordshire.

1732—Cattle were first brought to the Savannah settlement in Georgia by Oglethorpe.

1750—The French of Illinois were in possession of considerable numbers.

1783—Messrs Goff, Reynolds and Patton, of Baltimore, sent to England for cattle, probably of the Treewater or Hohlerness breed.

1785—Mr Patton, Jr., carried a bull of above importation to Kentucky.

1797—Mr. Heaton, of Duchess Co., N. Y., imported from England a Short-horn bull.

We find few systematic attempts at breeding previous to the revolution. In the nineteenth century we have record of numerous importations of the highest class animals of superior breeds.

Butter Factories.

Just now factory butter, like factory cheese, brings an extra price. In butter factories, as in cheese factories, a superior class of help is employed, and we think the expenses to the patrons are lightened and the profits increased. We find it so among our cheese factories, and so farmer's wife who has been once rid of cheese-making would be willing to return to the old method. It would be just so with farmers' wives if the farmers in the butter district were once to adopt the factory system of making butter. It is such a relief to the family! And as the sales are generally made oftener, there is the advantage of always having ready money. The same mode of dividing expenses and the proceeds of sales may be employed in butter factories that are employed in cheese factories; or, a company may be formed to buy the milk; or, as we have elsewhere suggested, only cream might be taken to the factory. As to the buttermilk and skimmed milk, that may be fed to hogs or calves. If the factory is to be conducted on the *pro rata* system, a good way would be to purchase calves or hogs with the money of the patrons, taking those of the patrons at a fixed rate per pound, put them together, and employ a man to take care of

them. If any additional feed is needed, let it be purchased with the common fund by an executive committee. In the Fall, when the calves and hogs are disposed of, let the proceeds be divided *pro rata*. It seems to us that this would give satisfaction, and we know it would make freer, happier homes to get rid of the care and drudgery of the dairy. This, to us, is a vital consideration, and induces us to favor any kind of profitable association that will lift the burdens from the backs of our women.

A Canadian Factory.

Mr Robert Madden, of Newburg, Ontario, furnishes the following summary of the operations of the Newburg factory, during the season of 1873. The season was of six months' duration, and the factory is under the management of Mr. Madden. He receives a commission of 2½c. per pound for making and furnishes everything, drawing the milk to the factory, drawing the whey to the patrons, and delivering the cheese at the point of shipment. The following is the record of the season:

Pounds of milk received.....	1,473,110
" " cheese made.....	153,664
" " milk to lb. of cheese....	9'58
Average price of cheese.....	11c
Total receipts from sales.....	\$16,903.04

—*Utica Herald.*

A Milk Tester; How to Make and Use It.

Take a dairy salt box which has the cover removed, turn it on its side with its open top toward you or in front, bore some holes in what now forms the top of box of sufficient size to insert glass tubes, letting the lower ends of tubes stand on what now forms the inner side of bottom of box. These tubes may be made from lamp chimneys of the German student pattern, which may be had at nearly every country store, and if the bottom or bulge part is broken off, all the better.

Now stop up the contracted part of chimney with a cork coated with gum-shellac, melted sealing wax, or anything which may assist in holding the cork and making it milk tight, and you then have a uniform column of milk about eight and one-third inches high, which, divided into one hundred parts, will make twelfths of inches, which degrees may be put on card board or a piece of shingle forming a scale of which each twelfth of an inch represents one per cent. After these tubes are set into their places, pour into them the milk which has just been drawn from the respective cow, whose name should be attached on a piece of card to the corresponding tube, care being taken to properly stir or mix the milk of each cow separately, so as to get a uniform quality, for the milk remaining in the pail a few moments will be found richer at top than at the bottom of the pail, and such unstirred milk would be an unfair test.

Let the milk stand in these tubes in a room of a temperature of from fifty-eight to sixty-five degrees until you think the cream has all risen, which will vary in different cows from twelve to forty-eight hours, and you can then readily tell by applying the scale to the side of the tubes the percentage of cream of each cow, as well as see its color, and consequently learn the color and quantity of butter each cow will make, and learn their adaptation to butter or cheese purposes.

If the cream is low in percentage and light colored, then turn her to cheese purposes, or prepare her for the shambles.—*Cor. Vermont Farmer.*

Now is a good time to thoroughly mortar up any holes in your dairy; make a smooth, neat job of it, and then give the whole building inside and out two good coats of white-wash; lime is a great purifier in a dairy-house.

BUTTER IS CHEESE.—We notice, says the *Guelph Mercury*, that many of our exchanges are commenting on the high price of butter, and we can fully sympathize with them. The reason of the high price, however, is obvious, it being the direct result of the largely increasing cheese manufacture in every section of the province. It is a fact well known among dairymen that the milk required to make one pound of butter will make three pounds of cheese. Eleven cents is a fair average price for cheese the year round; so that to be equal to it, butter must realize from 30 to 33 cents. As the demand for cheese is practically unlimited, its manufacture will undoubtedly increase, and as farmers are not slow in finding out what pays best, we venture to predict that the price of decent butter will never again fall to so low a price as we have seen.

The Apiary.

Feeding Bees.

During the season of flowers, bees will feed themselves, and, if the blooms are abundant, their owners too. But there are times when the bee-keeper must in turn feed his bees. If the honey yield has been scant, or the extractor has been used too freely, hives must be fed in the fall of the year, sufficiently to carry stocks through the winter. In spring, too, there is often found to be a deficiency of food in the hive. Colonies differ so much in population, and are so variable in their consumption of honey, according to diversities of temperature, that no fixed rule can be given as to the amount of honey necessary to winter safely. Bee-keepers are, however, generally agreed in the rule that an average stock should be provided with thirty pounds of winter stores. Even this quantity has been found inadequate when a hive has been very populous, and has been kept over-warm. If kept at a proper temperature, bees get into a kind of semi-torpid state during the winter, and consume very little. But it is not easy to hit the exact conditions of wintering bees at the minimum of food supply, and it is always the part of wisdom to err on the side of plenty. To make assurance doubly sure, an examination should be instituted toward the close of winter, and if there is a lack of stores, more must be promptly given, lest the bees die of starvation.

When the hives are taken from their winter quarters, and their inmates are allowed their first spring flight, it should be ascertained, beyond the possibility of mistake, whether they have enough to live on until the flowers come. The condition of box hives is necessarily very much a matter of guess-work, as it must mainly be arrived at by "hefting" or weighting them. Everybody who has tried experiments as to the weight of any article by lifting it, very well knows how uncertain a test this is. If the muscles are in a weak state from any cause, the weight will seem greater than it really is. It is better to err on the right side, and give food if there is the least suspicion of deficiency. In the case of movable-frame hives,—and these are essential now-a-days to really intelligent and successful bee-keeping,—it is easy to find out positively what honey stores there are, by opening the hive and taking out the frames. This ought to be done at the time of the first flight, for other reasons than the one now specially in view, such as to ascertain whether the stock has a queen, to see if there are any moth-miller worms, and to clean out the hive. A little neglect, just at this time of year, often costs the bee-keeper dearly. A colony has come safely through the winter, but is almost out of food. Attention to their state will save a valuable stock, while if neglected just a day or two too long, they will be lost. We believe that the mortality among bees in spring, resulting from want of food, is only second to the winter mortality, which proves in so many cases the great discouragement to bee-keeping.

But whether hives are short of supplies or not, they should invariably be fed a little, for another and most important reason in addition to the necessity of it, in many instances to secure the continued existence of the bees. Feeding has the effect of stimulating multiplication. The instinct of the queen impels her to lay whenever the bees are obtaining food from without. As this is stored in some of the cells, the queen lays in others, and thus the stock increases in numbers and strength. Early spring feeding has, therefore, a most powerful and vital influence on the profits of the season. Our honey harvest is but a short one, and it is of the greatest importance, that while it lasts there should be a strong force of workers to gather it in. There must be early breeding to

secure this. If there are not hosts of bees in June and July, no matter how ample the yield of honey in the fields and woods, it will not find its way to the hives. Everything as to the success of bee-keeping depends upon having the hives populous at the beginning of summer. Not only will they fail to gather honey largely, if weak in numbers, but they will be unable to swarm, for swarming with bees, like emigration with man, results from having a surplus population. A very small amount of food, given daily, will stimulate breeding and secure the desirable condition of things in June just referred to.

As to the *modus operandi* of feeding, many plans have been adopted. Sugar syrup, with a small proportion of honey in it, is a good fall feed, and should be given not later than September, to secure its being conveyed to the cells, and sealed over for winter use. When it is found in mid-winter that a stock is deficient in supply of food, we believe there is nothing better than solid cakes of white-sugar candy. The bees will manage to live well on these, and there is no slovenly besmearing of the hive and its inhabitants. But in spring, when the aim is not only to support life but to stimulate breeding, syrup should be used, or pure honey. We have found a syrup made of three pounds of crushed sugar to one of honey, answer an excellent purpose as a spring feed. The food must be supplied *inside the hive*. If set here and there among the hives of an apiary, it encourages robbing, a vice to which bees, especially Italians, are sufficiently prone without being incited that way. Bees can be best fed, especially while the weather is rather cool, at the top of the hive, and great care must be taken that none of the warmth created inside is wasted, as it is all needed to secure the hatching out and vigorous growth of the young brood. Various bee-feeders are offered in the apicultural market, as may be seen in the advertising departments of the bee journals and agricultural papers. Of those we have tried, we have been best pleased with one offered by Mr. C. C. Van Densen, of Sprout Brook, N. Y. It is very simple, and its use involves no escape of heat from the hive. But we have succeeded quite as well with a homely contrivance of our own, which we will briefly describe. An inner cap is made to go over the opening in the honey-board, and is covered with wire-cloth, in which a hole is made for pouring the syrup through, and a small wooden-plug fitted to the hole. To keep in the warmth, a piece of old carpet or blanket is laid over the wire-cloth. An old oyster-can or sardine-box, opened on the broad side, constitutes the feeder proper. The tin cover is cut smoothly off all round, and a shingle float fitted to the inside of the can or box. This float is bored full of gimlet holes, and made so loose a fit, that it will rise or fall with the syrup. The bees will feed from the float without being entangled and drowned in the syrup, and after two or three feedings, will greet the bee-keeper with a pleasant hum when he comes to feed them, hastening to the float with the greatest alacrity. We like this plan of feeding, especially because it allows a large number of bees to engage in the work of carrying down the supplies into the hive. This creates a cheerful, busy alacrity which pleases the workers, puts the queen into laying humor, and promotes the general contentment and prosperity of the hive.

An Appeal to Bee-Keepers.

One of the leading apiculturists of Illinois, C. Dadant, in a communication to the *American Bee Journal*, has the following remarks to make concerning package and baggage smashers:

Are you tired of railroad men? Friends, bee-keepers, I, for one, am much fatigued with their roughness in regard to my goods. One hundred dollars would not cover the loss I have experienced by their rough handling. In spite of all kinds of warnings on the address, they handle the queens, the hives and the boxes of comb honey as if they were recommended

not to allow the contents of a single box to pass through their hands without being smashed.

I have had so many queens killed by the smashing of combs, that I prefer to have them starving on their way, rather than to give them comb somewhat heavy with honey, my risk being smaller.

This spring I sent three stocks of bees to a bee-keeper in Iowa. All kinds of warnings were written upon the address, and besides, the receiving agent promised to see to their careful handling. Well, my three stocks were put in the cars, bottom side up. Fortunately, they had only thirty miles to travel and no change of cars. One-half the bees only were killed, but the owners were safe.

I have tried three times to send honey by railroad—the third time only fifteen miles—and every time all the combs were smashed down; yet I had taken the care to show a part of the glasses of the boxes.

"But," say the railroad men, "we do not warrant living animals; we do not warrant anything contained in glass." Yet they charge higher rates on living animals and glass.

"But it is impossible to go with such a speed and to handle your goods with the care that you require." Why? Your speed is not greater than that of roads on the old continent.

In France, every other year, there is an exhibition of bee culture. Honey is sent in jars and combs from every part of the country, even from Italy, and over all railroads; yet not three per cent. of the comb is broken. This year at the exhibition of Vienna they had honey in combs, coming from the remotest parts of Europe. These combs had travelled all the railroads of France, Germany, Italy and Austria, and they arrived in good order.

Yet the railroad rates on the continent are lower than in this country. The railroad companies of France, Italy and Germany do not own the railroads in full property, for the roads return to the government after a lapse of ninety-nine years. Besides, the companies are liable to damages and interest if they do not have sufficient cars to transport goods as prepared, etc. Besides, the railroad companies of Europe do not receive such bounties as those of this country.

We have not yet arrived at the time when the honey crop encumbers the railroads. Ours is the necessity of carefulness.

Curiosities of Bee-History.

There are few hobbies which a man rides more eagerly, when he has once mounted it, than bee-keeping. It is not merely the pleasant occupation and continual change of interest which these industrious creatures provide for their master, that so engross his thoughts; but, luckily for human nature, always glad to engage in a fray, there are many vexed questions connected with the life and economy of the hive bee which evoke the love of controversy as well, in all properly enthusiastic apiculturists. From the days of Aristotle and Pliny to those of Swammerdam, Huber and Kirby, naturalists have wrangled over the bee. In the very last book published on bees, the dissensions of rival bee-keepers on disputed points in their life history, are still brought forth as prominently as ever. The object of this paper is to advocate no theory, nor to dilate on the wondrous instincts of the bee, but simply to recount some of the more curious lore connected with the little insect in ancient and modern times.

According to Virgil, Jupiter gave the bee its marvellous habits, because the bees fed him with honey when, as an infant, he lay concealed in the Cretan cave from his father's search. The Curetes, a Cretan tribe, used to dance round the babe and drown his cries by rattling brazen cymbals, whence comes the origin of swarms of bees of the present day being pursued by housewives with such clanging of keys against frying-pans, the belief being universal that this noise is agreeable to them. Indeed, Pliny, with questionable logic, argues because this clatter is always made when bees swarm, therefore they must be gifted with the sense of hearing. Kirby, who wrote a most valuable monograph on bees, estimated that there are about 250 species of them in England.

It is generally supposed that those bees which are peculiar to the New World are destitute of all offensive weapons. Humboldt, however, explains that they have stings, though comparatively feeble ones, and they use them very seldom—only, in short, when irritated and forced to defend themselves. While seated on the peak over Caraccas, in South America, he tells us—"Determining the dip of the needle, I found my hands covered with a species of hairy bee, a little smaller than the honey bees of the north of Europe. These insects make their nests in the ground; they seldom fly, and from the slowness of their movements, I should have supposed they were benumbed

by the cold of the mountain. They call them *angelitos* (little angels) because they very seldom sting. (Cosmos, 1. 433.)

Among the numerous tribes of leaf-cutting and mason bees common in England, most possessors of a garden must have noticed the ravages of the *me-mac-hile cuticularis*, one of the former class. It is much smaller than the hive bee, and cuts little segments, as clear as if punched out by a machine, from the leaves of roses and peas. The operation is very speedily performed, when the bee has once made her choice; the strong mandibles go to work, and soon the bee flies off with her green load. If followed, it will be found that her nest is situated in some palisade or gate post. The creature runs her tunnels into the wood by means of these same powerful jaws, and then lines them with the pieces of leaf. They are not fastened together, but the cells are honey tight, and as fast as they are lined with leaves, an egg is dropped into each. Perhaps Virgil, Pliny and the other ancient writers who speak of bees carrying ballast to steady themselves in windy weather, had witnessed the doings of leaf-cutting bees, and confounded them with hive bees.

What we know as the queen bee, was always, with the ancients, in treating of hive bees, called the king, and was regarded as the absolute master of the community. They describe him, truly enough, as being twice as large as the common bee, more glittering in aspect, and, says Pliny, with a touch of imagination, "on his brow glitters a whitish spot, like a diadem." Dryden shall translate from Virgil how he is obeyed.

The king presides, his subjects toils surcease,
The servile rout their careful Caesar praise.

—English Magazine.

BEES IN SILESIA—In the province of Silesia, Prussia, 260,000 colonies of bees are kept, representing a capital of more than a million of dollars. These, even in the most unfavorable years, yield a profit of ten per cent., and in propitious seasons, such as the year 1816 was, the yield was fully 100 per cent., or more than \$1,000,000. It is well ascertained that the whortleberry and buckwheat blossoms are much richer in saccharine juices on the poor soil of Silesia than in more fertile districts.

Correspondence.

Herd Book Query.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—Will you kindly inform me whether grade dams can be registered in the Herd Book when registering a fourth cross Short-horn? A large number of four cross animals, now in the hands of private parties, have on their "certificates" the names of four grade cows, and four Short-horn bulls. Please state the result.—Yours, &c., W. C. S.

[Four crosses by registered Herd Book bulls render the animals referred to by our correspondent eligible for Herd Book registration.—Ed. C. F.]

Reducing Bones.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—I noticed some time ago, in your valuable paper, a formula for reducing bones; and as I have mislaid the number containing the same, you would very much oblige by giving a re-insertion.

Yours, &c.,

McGREGOR.

[The formula referred to by our correspondent appears on page 414, Vol. X. C. F., 1873. It reads as follows:—"Place them in a large kettle mixed with ashes, and about one peck of lime to the barrel of bones. Cover with water and boil. In twenty-four hours all the bones, with the exception perhaps of the hard shin-bones, will become so much softened as to be easily pulverized by hand. They will not be in particles of bone, but in a pasty condition, and in excellent form to mix with muck, loam or ashes. By boiling the shin-bones ten or twelve hours longer, they will also become soft."—Ed. C. F.]

Diseases of the Eyes in Sheep.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—A number of my sheep are troubled with disease of the eyes, which produces blindness, but does not appear to affect the general health. If you can suggest a remedy, you will very much oblige
A SUBSCRIBER.

[It is hard to say, from the short description given, what the precise nature of the disease is that affects our correspondent's sheep. If the eyes appear irritated, and the lining membrane of the eye-ball and eyelids reddened, bathe the parts with tepid water once or twice a day, and afterwards apply a lotion composed of sulphate of zinc one drachm, laudanum two ounces, water one pint. Sometimes the eyes are weakened from penning up sheep in a very dark place.—Ed. C. F.]

Wild Oats.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—Enclosed I send you a few seeds for identification. Please state in the CANADA FARMER whether they are "wild oats," and oblige
A HURONITE.

[The sample submitted is undoubtedly the *avena fatua*, or common wild oat, and one of the greatest pests that a farmer can possibly have to contend against. It is a considerably taller plant than the cultivated variety, and of ranker and more rapid growth, surpassing in the latter respect any crop among which it may unfortunately happen to find a lodgment. Various methods have been suggested for its extermination, such as fallowing and then ploughing under the germinated seed; harrowing the stubbles in order that the ripened seeds may be induced to grow with a view to their being afterwards killed by the plough, &c. Either of these methods, or a combination of both, may to a certain extent prove successful; but the safest plan, when at all practicable, is to pass through the crop infested as soon in spring as the pest makes its appearance, and utterly root out and destroy every vestige of the abomination. What say our agricultural readers on this subject?—Ed. C. F.]

Transplanting Turnips.

(To the Editor of the CANADA FARMER.)

DURHAM, Co. GREY, March 11, 1874.

DEAR SIR:—The following are extracts from the CANADA FARMER of two years ago, in reference to transplanting turnips:—

"As the plants are pulled the tap-root is cut off and the leaves shortened to four or six inches. Furthermore, the plant is benefited rather than injured by being removed and trimmed."—*American Agriculturist*.

"The work of transplantation must proceed thus: Water the seed bed well the first thing, and let the moisture penetrate for half an hour, then take up the plants, taking especial care not to break off any of the fibres or main roots."—*Pectis*.

You will perceive that here is another instance wherein the doctors disagree. Will you have the goodness to give your opinion in the matter, or, if you will allow me, I would suggest that your views be given in the CANADA FARMER at an early date. I intend planting a good sized field this year, and am inclined to try the transplanting.

I would esteem it a great favor if you would "ventilate" this subject in your paper.

A SUBSCRIBER.

[Will those of our readers who have had some experience in transplanting turnips favor us with an account of their method and the results. The particular question is this: Should the tap-root be cut off or carefully preserved (from being broken)?—Ed. C. F.]

Disease of the Heart in Horses:

(To the Editor of the CANADA FARMER.)

DEAR SIR:—I had the misfortune to lose a valuable horse a few days since; and as there appears to be a difference of opinion among veterinarians as to the direct cause of his death, I will describe the case as accurately as I can, and ask your opinion.

The first symptom noticed was a difficulty in swallowing, and although there was no apparent swelling or tenderness about the throat, he either could not or would not taste a morsel of food. After about six hours his limbs seemed paralyzed, and he fell down, nor could he be raised again even with the assistance of four men. His pulse at this time was scarcely perceptible, but still he manifested little or no signs of suffering.

I sent for a veterinary surgeon of considerable experience, who at once pronounced it a hopeless case of heart disease. In about eighteen hours from the first attack the animal died, and a *post mortem* examination showed that all the parts had been healthy, excepting the heart, which was too large, being nearly a foot in length by nine and a half inches in diameter. So I pronounced it death from enlargement of the heart, a verdict from which the surgeon did not dissent. But my son has since incidentally mentioned the circumstances to another veterinary practitioner of good standing, and he ridicules the idea, saying he never knew or heard of a horse dying of enlarged heart. Now, Sir, what is your opinion?

J. G.

[Enlargement and other diseases of the heart are by no means uncommon in the horse, and may be placed amongst the causes of sudden death. A horse, however, may have a large heart, and yet a perfectly normal one. Judging from the description of the symptoms in the case referred to above, they certainly indicate great nervous depression, such as may occur in cerebrospinal meningitis, or they may have resulted from primary disorder of the digestive organs. The party in attendance, and who made the *post mortem* examination, if a competent practitioner, should be able to give a sound opinion on the case.—Ed. C. F.]

Darnel—Lolium.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—I enclose a stalk of a grass or grain, and will thank you to give the name and uses, if any, of the same. I found it growing on my farm here, in soil broken up for the first time last year. No one here can give me any information about it, and I have been advised to write to you on the subject.

F. SONES, Clinton, British Columbia.

[The sample we have received, though bearing unmistakable evidences of rough usage in running the gauntlet of the various post-offices between here and British Columbia, is quite recognizable as belonging to the genus *Lolium*, or Darnel, of which there are several varieties. *Lolium temulentum*, or Bearded Darnel, to which the variety now under consideration undoubtedly belongs, flowers early in July. The grain is poisonous, producing headache, dizziness, and other symptoms of intoxication such as are produced by ergot of rye. "It is generally considered by commentators," says Mr. C. Johnson, "that the word *zizania*, occurring in the parable in the 13th chapter of St. Matthew, translated from the Greek version as *tares* sown by an enemy among the wheat, refers to darnel. The manner in which it is still separated from the wheat in some parts of Syria, drawing up both together by the haul, and afterward collecting the darnel stems in bundles apart from the corn, is perfectly consistent with the close of the parable in verse 30." Mr. Gorrie says that he has heard old farm laborers in the best wheat districts of Scotland relate the terrible things that they had seen and felt in the "dear years" toward the end of last century, when compelled by necessity to use the produce of inferior wheat, mixed, as it then too often was, with the pernicious "doits," the Scotch name for darnel.]

Staggers in Horses.

(To the Editor of the CANADA FARMER.)

STR:—Some time ago I had occasion to ask, through your valuable columns, advice respecting a certain disease in cattle; and your promptitude in answering my request and the valuable information given, leads me to again avail myself of your opinion upon a disease prevalent here among horses, commonly known as staggers. There being no veterinary aid to be had in this district, it is only through the medium of your paper that your subscribers can obtain any reliable information in matters which directly interest the farmer.

Horses that run at large during the winter season, and are daily supplied with hay, as a general rule escape any attack of staggers, but those housed during the severe weather and fed upon timothy or oat hay and gram, appear to be the only animals which fall victims to its more or less fatal results. A horse will sometimes show every sign of good health at night, and the following morning will exhibit severe symptoms of the presence of the disease, and in two or three days the system appears thoroughly prostrate, with no disposition to move for dread of falling. The eyes have a heavy and inflamed appearance; and on any attempt being made to approach the animal, he throws up his head as though suddenly startled, and with difficulty saves himself from falling back upon his haunches. He seldom or never lies down, but stands with the fore legs somewhat wide and inclining forward, in which position he appears to be constantly sleeping until the disease has developed itself into a thorough contraction of the muscles, accompanied by tetanus, and the animal soon dies in dreadful agony. Can this disease be attributed to an insufficient supply of water, or to any injurious weeds that may be contained in the hay?

A COMOX FARMER.

[Judging from the excellent description of symptoms given, we have no hesitation in pronouncing the disease as having been primarily caused by disorder of the digestive organs, with subsequent disarrangement of the nervous system. Such diseases are by no means rare, and often give rise to a variety of symptoms; sometimes delirium is present; at other times a comatose condition comes on, whilst not unfrequently paralytic symptoms are manifested. To prevent the disease, we would recommend the use of a moderate allowance of cooked food, as boiled oats or barley, with an occasional feed of carrots. In the treatment of this disease a purgative should be administered—aloes, eight drachms, made into a ball, with a little gentian or ginger—to be given on the first signs of an attack. In very severe cases, one drachm of calomel may be given with the aloes. Injections of warm water should be given every two or three hours until the bowels act freely. Encourage the patient to take plenty of cold water, and in some cases, great benefit is derived from the use of stimulants, as whisky or ale; or two or three ounces of sweet spirits of nitre, with two drachms of carbonate of ammonia, may be given in a pint of cold oatmeal gruel every three or four hours. When one or two animals become affected in the same stable, the food should be changed immediately, and a brisk purgative given to the unaffected ones.—Ed. C. F.]

Books on Farming.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—Is there any good work you can recommend on Canadian farming as practised in this country? I have a number of works on Agricultural Chemistry which I brought with me from England, two years ago, but I thought it was of little use bringing books on farming, the climate and seasons being so different. A reply through the columns of the FARMER will much oblige, yours truly, R. C.

[The books chiefly used in Canada are the standard British publications, with which our correspondent is no doubt familiar, and a few of the better class of works published in the neighboring States. The only really good work on the subject published in the Dominion is the CANADA FARMER, which is now in its eleventh volume, and steadily increasing in circulation and influence.—Ed. C. F.]

THE CANADA FARMER

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THE GLOBE PRINTING CO.,

TORONTO.

Agents wanted in every town and village in the Dominion to canvass for subscribers. Liberal commission allowed. Send for circular stating terms.

The Canada Farmer.

TORONTO, CANADA, APRIL 15, 1874.

Opening of the Ontario School of Agriculture.

As our readers and the general public are already aware, from the advertisement which has appeared for some days past in THE GLOBE and other journals, arrangements are being made to open the Provincial School of Agriculture at Guelph on the 1st prox. It is matter of congratulation that facilities are at length afforded for imparting to the rising youth of our land a thorough scientific and practical training in the duties of that avocation on which, more than any other, the prosperity of all our business interests is dependent. We trust that the efforts of the Government in this direction will be seconded by the community at large, and that our more intelligent and enterprising farmers, who have been taught by experience the importance of a good agricultural education, will not be slow in sending their sons to the institution about to be opened for their especial benefit. Owing to the limited building accommodation, operations must necessarily be commenced on a very moderate scale, and, from the nature of the case, the first year's work must be largely of a preparatory character. Under these circumstances it has been deemed advisable not to appoint a full staff of instructors at first, and to postpone for the present any announcement of the permanent course of study and the conditions on which students will be admitted. Hence, the arrangements advertised are only temporary, provisional, and to some extent tentative.

It may naturally be expected, from the liberal inducements offered at the outset, that more applicants will present themselves than can possibly be admitted as pupils. With free board and tuition, and the prospect of fifty dollars in money at the close of the year should satisfactory progress be made, it would seem almost inevitable that a large number of applications will be made, involving the necessity of selection. Other things being equal, "first come first served" will doubtless be the rule, but, along with that, some regard must be had to qualification. The conditions prescribed are certainly as easy as could well be desired, being those on which scholars pass up from a common to a high school. Most lads to whose early education any fair amount of attention

has been given are prepared for high school promotion at a younger age than that fixed for admission to the Agricultural Institution. But, beyond the requirements denominated, considerations of health, muscular development, aptitude to learn, and general fitness for the farmer's calling will no doubt be taken into account in selecting from a large number of candidates those best fitted to profit by the advantages offered in connection with the School of Agriculture. It is very desirable that a superior class of young men should be obtained, so that at the end of their period of training they may go forth to their several neighborhoods as missionaries of improved agriculture, capable of taking an active part in farmers' clubs, and qualified to introduce and encourage a better style of farming in the various localities to which they belong.

On one or two points, perhaps, there is need for a few words of explanation. From the fact that the report of the Commissioners appointed to suggest a programme of study and terms of admission proposed that each pupil should be nominated by a Township Council, it may be inferred that such nomination will be required for the present year, in addition to the qualifications which are specified in the advertisement. We have ascertained on inquiry that this is not the case. Whatever may be ultimately resolved on with regard to this particular, nomination by a Township Council will be dispensed with in the meantime. Applications are to be made to Principal McCandless direct, accompanied by certificates of moral character, good health, and educational standing. Candidates who cannot present certificates from a High School, College, Normal School, or County Board, will be examined as to their knowledge of the several branches mentioned in the advertisement, and we have good grounds for believing that if the applicants are eligible and promising in other respects, this examination will be a lenient one.

There may also be room for misapprehension regarding the daily labor that will be exacted. The advertisement states that the pupil must engage, on an average, seven hours daily in the work of the farm, farm-yard and garden. In the report of the Commissioners it is recommended that the time specified shall be the average maximum of daily labor. Of course, it will not be possible to adhere to a certain exact proportion of work time each day. The season of the year, the state of the weather, the course of in-door study pursued at various periods, and other circumstances, will necessitate variation in the time devoted to out-door work. The average will not exceed seven hours, but the daily period will, obviously, often be less than that. The aim will be to make the instruction thoroughly practical, and to illustrate in out-door labor the principles inculcated in the class-room. There will be a large amount of out-door teaching, as the pupils will be in charge of foremen competent to explain the why and the wherefore of work done, and the object will be not so much to get work out of the young men as to make sure that they understand their business, perform it well, and can give good reasons for all the operations of the farm in which they engage. It is believed that this course of training will awaken interest in out-door work, relieve it very much of the nature of drudgery; and while habits of industry are inculcated, it shall not be a blind, mechanical industry, but thoroughly intelligent, engaging both the head and the hand in its various processes. On the one hand, care will be taken not to make the young men mere book-farmers by a too exclusive confinement to class instruction, and on the other no effort will be spared to elevate them above the condition of mere farm drudges, and to instruct them in the application of scientific principles to agricultural practice.

The idea seems to be entertained in some quarters that the young men will be subjected to a very strict, if not severe discipline, and that the amount of work required in and out of doors will be excessive. No

fears, however, need be entertained in these directions. Of course the students will be expected to face the serious business of life, and to apply themselves with becoming diligence to their duties; but they will not be over-taxed, neither will they be brought under anything like army or prison discipline. So far as possible, home and family influences will be thrown around them; they will be trained to courteous and gentlemanly behavior; and while no interference whatever with denominational connections will be thought of for a moment, their moral and religious character will be guarded by careful moral government, and by required attendance at daily prayers, and at their several churches on the Sabbath. The utmost pains will be taken to preserve the young men from evil associations and influences during what is, confessedly, the most plastic and formative period of their lives; and the discipline exercised will be kindly yet firm, uncompromising toward all that is wrong, and at the same time gentle and indulgent in regard to what is innocent, so as to win the subjects of it toward that which is good and praiseworthy. We believe that parents need not fear either the extreme of dangerous laxity or that of undue severity.

Exhaustion and Renovation of Soils.

An interesting lecture on this subject was recently delivered by Professor Buckland before the Canadian Institute. Mr Buckland said he regretted that he had not been able to prepare a paper on the subject, owing to other engagements. It was almost inevitable that exhaustion of the soil should follow the settlement of new countries, and the Canadian or American farmer could not be expected to improve in his efforts to remedy such a failure, while there were such vast tracts of new lands in the West. He noticed that in this country if land were utterly exhausted it would not pay any one to manure it with artificial manures. He noticed that here cultivation rarely went deeper than five inches, and that plant food might readily be thought to exist at a slightly deeper level, or that sub-soiling might at once remedy the exhaustion. If it did not, we could not hope in this country to effect this by artificial enrichment. The Professor next spoke of the theory that the rotation of crops was alone a means of maintaining the vigor of the soil. He described the soils that were adapted for different kinds of crops, and explained that some sorts of crops took certain portions of the food giving properties from the soil which were not required by others, and that in this way it was probable the rotation system was found to be so beneficial. He described the operation of sub-soiling and its purpose, which was to let in the air and the rain among the solid ingredients brought to the surface, and so bring out in life-giving shape all the elements of vegetable forms; so that when we found land exhausted we should ascertain what was the character of the underlying soil, if that combined the properties, even in a solid form, which were sought, it would be judicious to go on with the sub-soil operations. If the lower soil did not contain these elements it would be better to leave it altogether, for artificial manures were too costly. The art of cultivation was to aid nature to reach and bring out those substances that composed the solid food of plants. One way of improving land was to let it run in grass, and the agency of air and rain would result in decomposing some of the ingredients required. Some years ago he met a gentleman a few miles from Chatham, who had cropped his fields with wheat for many years, and the land did not appear to be exhausted. The Professor thought this might be owing to water permeating the soil, and conveying the required particles of plant food, or decomposing it where it lay. The lecturer referred to his knowledge of certain localities in England where the exhaustless properties of the soil were the subject of

remark. Experiments were made, and, digging to a small depth, they came to a saline water which had evidently come in from the sea. In another place were found beds of shell-fish of early deposition, which contained a large proportion of phosphate of lime, and in each of these cases the phenomena was easily explained. He noticed that allowing stagnant water to remain was a frequent cause of unfruitfulness of the soil. Draining was the remedy for this, and he considered draining as the beginning of all agricultural art; manuring and cultivation were subordinate branches. Mixing of soils was a remedy, but it was too expensive in Canada. Ploughing the soil off old pastures and burning it, would give a crop or two afterwards, but it was poor economy and a bad plan. Decomposition more slowly than by fire was preferable. He pointed out forcibly the great loss sustained by poor husbanding of the manure. Here was the land going down, the crops failing, and yet the very food for plants is allowed to go to waste, exposed to sun and rain and atmosphere, and escaping the farmer's hands. He thought we should cultivate less and cultivate better. He would advise every young farmer to beware of letting his farm go down. It is possible to prevent it going down; but once down, it can scarcely be brought up again.—A Vote of thanks was passed to the Professor at the close.

The Crops.

There is now little doubt, we are sorry to say, but that a very large area of the wheat and hay crops throughout the country has been damaged by recent frosts beyond recovery. On heavy clay soils, in particular, the mischief done has been very extensive, the wheat having, in some instances, been found completely out of the ground. What renders the case all the more aggravating is the fact, that on account of the abundant yield of last season, farmers were induced to sow much more extensively than usual. The only recourse now is, to plough down the worst spots, and sow for spring wheat, or some other seasonable crop.

Bravo, Canada!

Such is the title of a communication which recently appeared in *Moor's Rural New Yorker*, and it details how a flourishing trade is carried on between the United States and Canada in horses, sheep, and various kinds of fat cattle which command high prices in the New York markets. This person brings these facts forward as a proof that farming pays, and pays well, if rightly managed. This traffic, notwithstanding freight, import duties, and cost of feeding, puts a handsome profit into the pockets of Canadian traders. The mutton, for example, which is obtained from these sheep, is vastly superior to anything of the kind that can be obtained from the New York butchers, and is in general request. The writer appeals to his countrymen to make an effort to improve their stocks, and to save the large percentage which is lost by keeping inferior grades of animals. However this may be, it is encouraging to know that Canada is far forward in the front rank in this, as well as in some other things, and we hope she will keep so. Our farming community has made huge strides in advance, and there has been much enterprise in these branches mentioned; and the result is as above mentioned. In order to maintain their well-earned vantage-ground our farmers will have to take an intelligent interest in all the improvements in stocks, and new kinds of appliances for agricultural purposes, and govern themselves accordingly.—Nothing accomplishes this better than a good agricultural paper, well edited and continually on the alert, to place before them everything of a useful and practical purpose in their line. We believe that it is no exaggeration whatever to affirm that the *Canada Farmer* is far in advance of any rival on the Continent of America, and we would most unhesitatingly recommend it to our agriculturists, as an authority of a very high character, and a journal of which the country has a right to be proud. Its various departments are edited by the

best talent, which can be pressed into the service, in the Dominion, and we sincerely hope that it will be widely circulated among the farming community. It began with a high standard in view, and it has been steadily improving. The last volume, for 1873, is full of the most valuable information, and as an agricultural manual is unsurpassed.—*Orillia Expositor*.

Importations of Manitoba.

The following statement shows the gold value of the ordinary necessaries of life imported into Manitoba during the year ending 31st Dec., 1873:—

Butter.....	\$9,714
Cheese.....	1,647
Lard and Tallow.....	1,411
Meats—fresh, salted or smoked.....	29,879
Preserved meats, poultry and vegetables.....	7,547
Horses.....	11,874
Horned Cattle.....	23,632
Sheep.....	2,081
Vegetables.....	2,696
Eggs.....	317
Flour of wheat and rye.....	45,708
Grain other than wheat or corn.....	17,490
Wheat.....	1,200
Public uses of the Dominion—smoked bacon, crackers, etc.....	20,836
Total.....	\$197,339

"There is not an item in the whole list," says the *Manitoba Gazette*, "that this country is not capable of producing in abundance."

"We trust that these figures will be largely copied into the Canadian papers, for nothing could be more encouraging to the intending agricultural emigrant than this reliable evidence of the large demand for farm produce in Manitoba."

The United States National Grange.

The patrons of husbandry have at length settled upon a definite policy. At the late meeting of the National Grange at St. Louis, a programme, or "platform of principles," "for the guidance of the world," was duly issued. Want of space prevents us from quoting more than a few of the more prominent clauses:—

1. United by the strong and faithful tie of agriculture, we mutually resolve to labor for the good of our order, our country, and mankind.
2. We heartily endorse the motto, "In essentials unity; in non-essentials liberty; in all things charity."
3. We shall endeavor to advance our cause by laboring to accomplish the following objects: To develop a better and higher manhood and womanhood among ourselves; to enhance the comfort and attractions of our homes, and strengthen our attachments to our pursuits; to foster mutual understanding and co-operation; to maintain inviolate our laws; to stimulate each other to labor to hasten the good time coming; to reduce our expenses, both individual and co-operative; to buy less and produce more, in order to make our farms self-sustaining; to diversify our crops, and to crop no more than we can cultivate; to condense the weight of our exports, selling less in the bushel and more on hoof and in fleece; to systematize our work, and calculate intelligently on probabilities; to discountenance the credit system, the mortgage system, the fashion system, and every other system tending to prodigality and bankruptcy, &c.
4. Our business interests: We desire to bring producers and consumers, farmers and manufacturers, into the most direct and friendly relations possible. Hence we must dispense with a surplus of middlemen; not that we are unfriendly to them, but we do not need them. Their surplus and their exactions diminish our profits. We wage no aggressive warfare against any other interests whatever. On the contrary, all our acts and all our efforts, so far as business is concerned, are not only for the benefit of producers and consumers, but also for all other interests that tend to bring these two parties into speedy and economical contact. Hence we hold that transportation companies of every kind are necessary to our success—that their interests are intimately connected with our interests, and harmonious action is mutually advantageous, &c.

THE SECOND MARCH NUMBER of the *Canada Farmer* has been received. We most heartily and unhesitatingly commend this journal to the support of our friends in the country. Every farmer should have at least one agricultural paper—and the best one issued in Canada is certainly the *Farmer*.—Semi-monthly, \$1.50 a year.—*Merford Monitor*.

Agricultural Intelligence.

SHORT-HORN SALES.

Birch Grove.

The sale on Tuesday last of the entire herd of Short-horn cattle, a number of Cotswold sheep, and some choice Berkshire swine, the property of Mr. J. R. Stanton, Thornhill, was in every respect a decided success. The attendance of breeders, local and American, was very large. Among the latter we noticed the well-known faces of Messrs. S. R. Streater, Cleveland, Ohio; B. B. Groom, Winchester, Kentucky; B. H. Day, Iowa; A. B. Straun, Ottawa, Ill.; J. Collard, Iowa, &c. Mr. Page conducted the sale with his usual well-known ability.

In the Short-horn class, the first animal offered was "Second Lady," a handsome and well-bred red and white four year old cow, which was knocked down to Mr. B. B. Groom at \$600. "Third Lady," also red and white, aged six months, followed to Mr. Miller at \$200. "Second Duchess," roan, calved August, 1869, was purchased by Mr. R. C. Kennedy for \$600. "Dignity," a red three-year-old, was also knocked down to Mr. Henry Lemon at \$600. The remaining animals were disposed of as follows:—

Table listing various animals and their prices, including Delight, La Brillante, Second Maid of Thornhill, etc.

Bulls.

Table listing bulls such as Duke of Thornhill, Brown, Omaha, 2nd Duke of Thornhill, Sir Charles, etc.

Summary.

Summary table for bulls with columns for Average and Total prices.

The sheep sold well, six rams averaging \$32, and twenty ewes and ewe lambs \$27. The swine brought all prices, from \$12 to \$36.

Willow Lodge.

The sale of the "Willow Lodge" herds and flocks by the executors of the late John Snell, at Edmonton on Wednesday, was attended by a large and influential assemblage of leading stock breeders and dealers from all parts of Canada and the United States. All the animals offered were in first-rate condition, and the bidding was exceedingly spirited.

Cows and Heifers.

Table listing various cows and heifers with prices, including Golden Drop, Golden Circle, Crimson Rosebud, etc.

Table listing various animals and their prices, including Rosa Donheur, Rocwood, Minaret, Moss Rose, Moonshine, Zoo, Zora 7th, Belle Boyd, Diadem 4th, British Baron's Beauty, Lorena, Hortense, Clara Barton, Fairy Gem, Fairy Queen, Pride of the Lodge, Souvenir, Miss Bell, Jenny Lind, Golden Rose, Rose of Summer, Memento, Mary Grey, Grace Darling, Queen Mary, Sensation, etc.

Bulls.

Table listing bulls such as British Baron, Chancellor, Royal Butterfly, Col. Towneley, etc.

Summary.

Summary table for bulls with columns for Average and Total prices.

The sheep sold well, "King of Troy" going to Simon Beattie at \$200, and the pen of five prize animals to John Collard, Mr. Teasdale, Grahamsville, and George Davis, Brampton, at prices ranging from \$160 to \$230 each. The imported Berkshire boar, "Sir Heber Humfrey," was knocked down to Mr. Adam Rankin, Monmouth, Ill., at the handsome figure of \$245, and the imported sow, "Lady Gloster," to J. R. Craig, at \$300. The entire proceeds of the sale amounted to nearly \$22,000.

Kinellar Farm.

The third Short-horn sale of the week, that of the Kinellar herd, the property of Mr. Hugh Thompson, St. Mary's, was decidedly the most successful of the series yet held. The attendance, notwithstanding the almost impassable state of the roads, was large, many of the buyers at the Edmonton sale of the preceding day being present. Most of the animals offered were either imported or the offspring of imported stock, and consequently sold well. The following statement of prices, &c., will be interesting:—

Cows and Heifers.

Table listing various cows and heifers with prices, including Raspberry, Cowslip, Minnie Halkerton, Minnie Eskdale, Golden Drop 2nd, Golden Drop 3rd, Maggie Hill, Miss Ramsden 4th, Miss Ramsden 5th, Minnie Darby, Sanspareil 10th, Sanspareil 12th, Duchess of Greenwood, Madeline, Madeline 2nd, Lady Bertha 2nd, Pearlite Butterfly 2nd, Oxford Queen, Zuma, Geneva, Dublin, Nelly Grey, etc.

Bulls.

Table listing bulls such as Baron Cecil, Cohen Duke, Lord Ramsden, etc.

Summary.

Summary table for bulls with columns for Average and Total prices.

Forfar Chief, a handsome five year old Clydesdale stallion, brought \$1,250, and two other animals of the same class over \$1,000 each. A very fine span of young mares of the same colour and breed was purchased by Prof. McCandless at \$475.

Great Show and Sale of Short-Horns at Birmingham.

The sale recently held in Bingley Hall, under the auspices of the Midland Counties' Club, was a grand success, the number of entries being 252, or an increase of 76 over that of last year. The attendance of breeders and dealers was also much larger than on any former occasion. The \$500 prize, given to the best bull between the ages of ten and twenty months, was awarded to a roan, fourteen months old, bred by Mr. Garne's Aachen, and which was subsequently knocked down to Mr. Hower, of Northleach, at \$735. The average price for the fifteen which constituted this lot was \$385 odds.

In the second class, that of bulls from twelve to twenty months old, no fewer than 66 animals competed, and the first prize of \$160 was won by Autumnus, bred by Col. Lloyd Lindsay. This beautiful animal sold afterwards for \$325. The average price realized for the lot was \$245.

In the next class, that of bulls between six and twelve months, 98 competed. Mr. Stratton's first, is a dandy, light roan, which sold for \$473. This class averaged \$205 per head.

Among the cows and heifers the most attractive animal was Moss Rose, a valuable cow, bred by Wakefield. She fetched \$1,351, having been bought by a Mr. Bennion. Several good heifers and some middling two-year-old bulls appeared.

The sale was on the whole a good one, though there were rather too many animals for disposal by one man in one day.

Mr. JAMES ROSS, of Pilkington, a few days ago sold a three year old team horse for \$250, to Prof. McCandless, of the Model Farm.

SALE OF STOCK.—Mr. John Reading, Guelph Township, sold last week to Mr. John R. Craig, Edmondton, a thorough-bred Durham bull for \$500; a three-year old heifer for \$400; a two-year old heifer, with calf at foot, for \$150; and a heifer calf, eight months old, for \$180. Also, to Mr. Isaac H. Bauman, Waterloo Township, a yearling bull, for \$110.

SHIPPED.—Mr. Christopher Barker, of South Dumfries, last week sold two four-year-old steers to Mr. Oliver, of Galt, which weighed 1,875 lbs. and 1,710 lbs. Mr. B. also sold a cow, the weight of which was 1,660 lbs., and four yearling steers, to Mr. Oliver. The steers averaged 1,200 lbs. Mr. James Davidson, of South Dumfries, sold three fat three-year-old steers to the same butcher, which averaged 1,600 lbs. The animals above referred to were shipped on Friday last for the Montreal market.

A GOOD COLT.—Mr. Alexander Innes, of Stanley, purchased on Monday last, from Mr. Charles Brooks, of Hibbert, a fine heavy-draught colt, 11 months old, paying for it the handsome sum of \$400. This colt was sired by Mr. Brooks' imported Clydesdale stallion, "Lord Haddock." It is a very superior animal, being well built and of large size. Although only in ordinary condition, it weighs 1,010 pounds. It was raised near St. Mary's, and was purchased by Mr. Brooks about three months ago.

WHAT CONSTITUTES A CAR LOAD.—Below will be found a statement showing what constitutes a car-load, and though it may not exactly suit everywhere, it approximates so closely to a general average, that shippers hereabouts will find it a great convenience as a matter of reference. As a general rule, 20,000 pounds or 70 barrels of salt, 70 of lime, 90 of flour, 60 of whisky, 200 sacks of flour, 6 cords of hardwood, 7 cords of soft wood, 18 to 20 head of cattle, 50 to 60 head of hogs, \$0 to 100 head of sheep, 9,000 feet of solid boards, 17,000 feet of siding, 13,000 feet of flooring, 40,000 shingles, one-half less of hard lumber, one-fourth less green lumber, one-tenth less joists, scantling, and all other large timber, 340 bushels of wheat, 360 of corn, 650 of oats, 400 of barley, 360 of flax seed, 350 of apples, 360 of Irish potatoes, 1,000 bushels of bran.

Breeder and Grazier.

Casualties in the Lambing Folds.

On some farms we hear complaints of weakly lambs, and mortality amongst mothers and offspring. A mild, open winter almost invariably brings a large percentage of disasters at lambing time. In a grass country the in-lamb ewes are then apt to be left in the fields to get their living as best they can, they are considered to be independent of concentrated dry food; indeed, unless penned up, few ewes roaming on the grass care to eat dry fodder. Hence, as is so notable this year, the condition of the ewes is by no means so good as it ought to be; the starved lambs come weakly and pot bellied, there is little milk secreted for them. Especially amongst the smaller farmers on the clay soils both in Scotland and England thousands of such ailing ewes and sickly lambs are now to be met with. As every experienced shepherd knows, such subjects require very careful management. Many hopelessly reduced, quite anemic or bloodless, puck about, better one day worse the next, often a few weeks hence being fatally purged by the fresh, succulent grass. In such unsatisfactory cases, whether before or after lambing, the rational treatment consists in liberal supplies of good hay, with one to two lbs. daily of equal weights of oats, beans, or peas and beans.

Our mild winter tells in another way prejudicially on the successes of the lambing. It greatly economizes roots, and ensures the gravid ewes being supplied with more than is good for them. The bulky, moist, cold food greedily devoured, often in undue quantity at a time, stunts the growth of the fetuses. Ewes having full supplies of roots always leave a large number of dead and rotten lambs, are besides prone to miscarry, and moreover often have severe times of labor. The most healthy food for gravid ewes consists of a few roots or grass, with liberal allowance of dry food, such as five or six pounds of hay or chaff, mixed with a little cake or corn. They are better roaming at large. Ewes in lamb closely penned up seldom get enough of exercise, and are probably more subject to false presentations and tedious labors. From running of dogs and other rough usage, from being turned up to pare the feet, gravid ewes must be carefully preserved.

To minimize losses amongst lowland flocks, the breeding ewes, as they approach within a week of lambing, should at night be brought into a large, sheltered, dry yard, well provided with either temporary or permanent shedding. Where such accommodation is not attainable, a handy yard is often improvised in the dry corner of a sheltered grass field, by an enclosure made with a double row of 6 feet hurdles set about 18 inches apart, the interval being well crammed with straw, or straw and leaves. For ewes lambing or recently lambing, round the shed or yard are placed small pens made with ordinary hurdles. Unless when under cover, these lambing pens require to be further protected from wind and weather by placing on a slope overhead a wattled or close thatched hurdle.

The ewes after lambing are usually kept for one or two days in these smaller pens. Twins at once marked to recognize them, require, of course, extra attention, for one of the pair straying away is apt to be disregarded by its mother, and by-and-by is refused its share of sustenance. The ewes continue to be fed as already advised; a few Swedes now given helps the milk, but too many roots, whether turnips or mangold, render the milk irritating and apt to scour the lambs. Where the ewes are in poor condition, and short of milk, and other suitable food is scarce, bran, oats, brewers' grains, and malt dressed prove useful helps. For twin lambs and others whose ordinary food supply is inadequate, the shepherd should have daily a bottle of cow's milk, which he should mix as required with about an equal quantity of hot water and a little sugar. This dilution and sweetening of the cow's milk gives it more resemblance to ordinary ewes' milk, renders it more digestible, and prevents its forming the hard lumps of intractable curd which are so provocative of indigestion and diarrhoea.

So soon as the ewe lambs, the shepherd satisfies himself whether another is to follow; he trims away any wool about the udder, which, getting into the lamb's stomach, is apt by and by to occasion indigestion and obstruction; he removes the after-birth, and leaves mother and offspring in their small pen. Mechanical interference is rarely required amongst ewes that have been properly managed. The fetus usually comes with the fore feet and the head slightly turned to one side, resting upon the knees. When, however, a ewe comes to her full time, and has been

for some hours restless and straining, the cause of delay should be sought for, the patient placed on her side with her hind parts somewhat raised, the finger introduced, and any false presentation rectified. Occasionally one or both fore limbs are bent up; sometimes one or both are down below the arch of the pelvis, and the nose alone can be felt. In these and many other such unnatural presentations, the ewe's hind quarters must be raised up, the fetus returned well back in the womb, and the fore or hind limbs, as may be most convenient, brought into the passages. Occasionally the head is down under the arch, and the fore feet can alone be got hold of. As in the former case, the lamb must be returned before any progress can be made with the delivery. Occasionally the head gets bent back. Some times the lambs lies right across the opening, and must be turned so that the fore limbs and head, or where more convenient the hind limbs, are first got away. Rarely the fetus is found on its back and requires to be turned round. With twins the chief difficulty is in securing the limbs and head of the same lamb, it is rather a hopeless business to drag away, as has many times been done, at the limbs of one lamb and the head of its brother. A dead lamb is usually a great deal more difficult to get away than a living one.

After a natural delivery medicine and doctoring are quite uncalled for. Where there has been a tedious, hard labor, and the parts have been bruised, they should be moistened with a little oil, and if there is any noisome discharge, as from a dead, decaying lamb or retained placenta, a little diluted Condy's fluid should be applied several times a day. For these and other cases where the patients do not care about their food, and are troubled with torpid bowels, the shepherd should have some boiled linseed cake by his fire in his hut, which it is most important should adjoin his lambing yard. At the fire of such a haven, with an occasional mouthful of warm cow's milk, and a few drops of whisky, gin, or sweet spirit of nitre, many a delicate lamb is saved which otherwise would certainly perish. After a short time ewes sometimes pant, heave, and strain; when this does not depend, as it is always worth while carefully to ascertain, on the coming of still another lamb, and if the after-birth has already been removed, the straining is indicative of some irritation of the womb. The patient must be kept quiet, and well fed on linseed meal and other slops, have any milk that is not withdrawn by the lamb regularly removed, and receive every two hours three drops of aconite tincture in a wine-glassful of water. Where straining and low fever appear amongst lambing ewes their premises should be thoroughly cleaned out and carbolic acid sprinkled about. If convenient it is in such cases a wise precaution that those still to lamb be taken to another yard. Within a very few days after parturition ewes and lambs should be got away to fresh ground; it is undesirable to keep too many together in yards; not only do the feet get soft and subject to foot-rot, but the lambs seldom thrive in the closer confinement of yards and pens.—N. B. Agriculturist.

Breeding of Short-Horns.

Every year facilities are increasing for purchase and disposal of pure bred stock. Within the last few years sales have been established at convenient centres all over the country, and, with the exception of a few of the older breeders, who still sell at home, a large proportion of the young bulls now appear in these sale rings. Some people say they dislike buying at such sales, affirming, which is quite reasonable, (1) that in the purchase of a bull the appearance of the sire and dam in a great measure regulates their choice. Still, reference can always be had to the pedigrees, and great care ought to be bestowed in the examination of these before purchasing. It does not follow, I hold, that because a bull has a long pedigree he is of necessity well bred. Pedigrees are to be met with including ten or twelve herd book or numbered bulls, and perhaps not one amongst the whole race of sires named could have appeared with credit in a show ring. It must be always borne in mind that like produces like to a certainty. Such likeness can be traced in the sires and dams for generations. Many disappointments are met with when, after purchasing a grand showyard bull, his stock comes of every type but the one expected. There are two things thoroughly inseparable in successful breeding—viz., good shapes and good pedigree, and whatever the fashionable pedigree enthusiast may say, no other system can or will benefit the nation at large or the Short-horns as a breed. I may have something to say on fashionable strains and their money values at another time, but it is enough for my present purpose to put pedigree and shapes on equal footing; and say breed from well bred bulls with

good shapes, whose progenitors have had the same qualifications inherent in their blood through judicious in and in breeding to a certain extent. Then and then only can one know what to expect in a bull's stock. It must also be borne in mind that there is such a thing as two equally well bred animals not "mating"—well bred animals of two distinct strains producing stock not at all like either parent; hence the truth of the saying of the late T. Lates, as to the difficulty of Short-horn breeding—"I will find," said he, "three men able to be Prime Minister of England before I find one man qualified to breed Short-horns." The importance of having really well bred bulls even in a herd of cross-bred cows is every year becoming more evident. I heard an intelligent exhibitor of fat stock at the southern show remark—"If one knows the beasts going to Smithfield, for instance, in the cross bred classes from Aberdeen and Moray, he can tell almost to a certainty where the prizes in these classes will go." There is no doubt but the cross from the Angus or Aberdeen cow has to do with this, but I go further, and assert that the use of such Short-horn bulls as many of the Aberdeenshire farmers put to their cows has been the main cause of the excellence of their cross-bred stocks. Fifty, sixty, and in some cases one hundred guineas have been given for bulls solely for crossing purposes. At some of the sales of young bulls prizes are offered for best calves to be sold, which no doubt encourages the breeders to use the best bulls as sires, so that their stock may compare favorably in the sale ring. If one takes a run through the different herds in England and Scotland, they cannot help being struck with the small number of really good young bulls to be met with. The number of youngsters advertised for sale just now in the different local and national papers is very great, and yet how few "gentlemen" will appear amongst them—"gentlemen" that can stand out from the common rank with that wealth and style that at once marks them as above the average. It is the common cry that Short-horn breeding does not pay—and I question if breeding the common sort does pay—but let those who have gone in for good sorts be encouraged by the thought that good youngsters—"gentlemen" as I have called them—will every year leave their commoner brethren further in the rear.—N. B. Agriculturist.

Soiling Stock.

Pasturing cattle, more especially feeding stock and dairy cows, is, on many accounts, a wasteful system. Every movement of the muscles of an animal results in a waste of the tissue or a substance of the body, which must be restored by the consumption of food. In an ordinary pasture a cow will travel many miles during several hours in collecting her food each day, thus using up a considerable portion of her food in the process of feeding. A large portion of the surface of the pasture is trampled over and buried beneath the droppings, and this is wasted or destroyed. The manure dropped by the animal is wasted either by being washed away, or dried up, or by lying too thick in one place. All these wastes largely reduce the produce of the land, or the benefit which the animal derives from it. Again, a pasture bears but one kind of crop, which after it has matured is of very little further use during that season. The result of all this is that from four to eight acres of land are required to maintain a cow throughout the year. By the soiling system, which is growing crops to feed stock, and confining the stock to yards or sheds, one acre or less may be made to support a cow during a year, and the lessened muscular exertion largely increases the yield of milk. For farmers owning small farms in localities where land is of high value, this system will be found of great advantage. To carry it into operation there needs to be a succession of crops which will mature one after the other, so that fresh, succulent feed may be supplied throughout the year. Those who have a piece of fall-sown rye and a clover field in fair order just now available, are very well situated for commencing to soil their cows. The rye may be cut early in May or late in April, and will furnish feed until the clover is ready to be cut late in May. The clover, if top-dressed with some fertilizer, will last until a piece of oats, sown as soon as the ground can be prepared this spring, is ready to be cut. The oats, if sown in successive patches of a quarter or half an acre each, to mature for cutting one or two days after the other, will last until July, when the early-sown corn will be ready for use. Corn planted in succession will or may last until September, or it may be varied with millet, peas, vetches, or second or third cuttings of clover or grass. Thus, until the growing season closes, there will be a constant supply of green, rich, juicy feed. The crop is removed from one plot, it is immediately plowed, manured, and sown to another,

and thus a plot which produced a crop of rye in May may be made to yield a crop of oats or peas in July, and a crop of corn-fodder or turnips after the second crop is removed. Here lies the great economy of this system. After September, when the feed becomes scarce, a crop of cabbages will be ready for use, to be fed with beets, carrots, or turnips, along with hay or corn-fodder, steamed or cut and mixed with meal, as the case may be. Roots of all kinds will be of the greatest value, but those which have no unpleasant flavor, as sugar-beets, parsnips, and carrots, will be the best. Throughout the winter hay, corn-stalks, the surplus of the green fodder crops, cured, and roots, will be fed, and, if the supply is liberal, there will be no falling off either in quantity or quality of the milk. Under this system there will be no pastures required, except a small run for the stock, where they may take exercise in the cool hours in the summer. A liberal supply of pure water should be furnished in the yards, and ample bedding and absorbents, if only dry earth or sand is used, must be at hand to keep the stables and yards dry. The intolerable heats of the summer will not be felt, while during the days the cows are shut up in a cool, shaded stable, and are fed with fresh, juicy herbage. The plague of flies will not be felt, and, in consequence, the product of the stock will be about doubled. The manure saved will enable very large crops to be raised, and the condition of the farm will rapidly improve. Having well tested this system and writing from experience, we have no hesitation in urging those of our readers who are in a position to do so to adopt it as soon as may be. The first year's efforts may not bring full success, but the experience gained will bring success the next year, and gradually, as the plans become developed, such aids as irrigation by water or by diluted liquid manure may be adopted, and will largely increase the produce of the land. Then the dairyman will be almost completely independent of seasons or weather.—*N. Y. Times.*

Pasturing Sheep.

Every flock master is anxious to get his sheep at pasture as early in the spring as possible. This is a laudable and wise practice, but is sometimes done at the expense of the pasture and not always to the best advantage of the flock. If the pasture is blue grass and of ample extent, the sheep may be turned on as soon as the grass fairly appears. If the pasture be of clover, the damage to the field will perhaps not be severe, but if of timothy and clover, sheep, which gnaw very close on short pastures, often do irreparable damage by eating away the bulb at the surface of the earth, which is a part of the plant and absolutely necessary to the existence of this grass; indeed, a meadow may be mown with a scythe so close as sometimes to kill the crop. How much greater then the necessity of feeding sheep until the grass is sufficiently high so that no danger may occur in that direction.

Many farmers believe that every day gained in turning the stock to pasture is so much feed saved; such, however, is not the case, for every extra day the flock is kept in the yards the grass is getting better and better, and when the flock is turned on, after a week's delay perhaps, the pasture is in such a condition that the animals are not obliged to gnaw to the very roots to get a scanty supply of dead grass mixed with a few short spears of soft and watery blades.

Beside this, if turned to pasture too soon, the flock is almost as much inclined to refuse good hay as when turned on full pasture. The consequence is, they stop growing and lose flesh, and the wool becomes prematurely loose, and in any event is reduced in quantity and quality.

Do not be in too great a hurry, therefore, to turn out in the spring, especially if a few warm days may have started the grass. Cold weather will surely intervene, perhaps severe storms of rain, snow, and sleet. The grass will keep and the sheep will be far better off in the barn or in good warm sheds, and you will have the satisfaction of knowing that you can keep them up to their feed without loss of appetite or deterioration of the wool. Once checked at this season, wool does not so readily recover as earlier in the season; and, as the animal begins to thrive on the grass, and warmer days come on, instead of growing, it loosens and sometimes begins to drop off before shearing time.—*Western Rural.*

LARGE CATTLE.—The Michigan Farmer says a large white ox, "Greely," owned and exhibited by Wm. Smith, of Detroit, recently fell, breaking one of his hind legs, making it necessary to kill him. His live weight was 4,100 pounds. This ox was a high grade Short-horn. His real mate, "Grant," is younger, and now weighs 3,930 pounds.

Sheep and Lambs.

Farmers are often inclined to allow their sheep to run over the fields as soon as the snow is off, and pick what they can from the pastures, and perhaps meadows. This is bad for the sheep and worse for the meadows. So far as the future condition of meadows is concerned, the farmer had better borrow money at three per cent. a month to buy the food which the sheep thus obtain. Nothing can be worse for a meadow than to pasture it in spring. The sheep bites close, and will often lift up roots that have been loosened by the frost, when these roots, if left alone, would grow again. The food thus obtained by sheep is of very little use, and only satisfies a morbid appetite for something green. It is much better to feed them in a yard till the pasture yields nearly food enough for them. Nicely cured, early cut hay will carry them out well in spring; but if you have only an indifferent quality of hay, a little grain or wheat bran, with a spoonful of oat-meal to each sheep mixed in, will pay well for cost. Oat-meal will prepare the system for grass better than any other food, except roots.—*Live Stock Journal.*

A Swill Cart.

We herewith give illustrations of an approved swill cart.

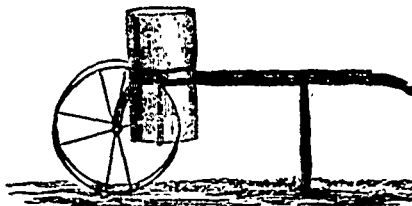


Fig. 1.

These illustrations require little description. Fig. 1 shows the cart loaded, ready to be wheeled to the pens. Fig. 2 shows its position during the process of

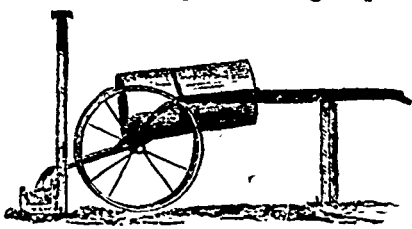


Fig. 2.

emptying it. Fig. 3 shows the form and mode of supporting the tub or barrel which contains the swill in the cart. Fig. 4 shows the manner in which the



Fig. 3.



Fig. 4.

forward part of the frame is attached to and supported by the axle of the cart. Every swine-herd will see its advantages and uses without further description.—*Rural New Yorker.*

An Old Breeder's Testimony in favor of Short-horns.

Mr. J. M. Woodruff, of Nineveh, Johnson county, Indiana, one of the truest of true Short-horners, in a note to Major Evans, speaking of Durhams says: "I have invariably found them when done breeding to fatten freely and make good carcasses of beef." And then, as going to show the vigorous constitution of the race, we find in another part of the same note these words: "Lost a Short-horn cow last summer, which is the first cow I have had to die in thirty years' handling." We have no comment to make, as these are facts from which every sensible man can draw but one conclusion as to the deserts of Short-horns. Mr. Woodruff is well known in Kentucky as a man whose word is as good as his bond, and whose success as a breeder entitles him to a respectful hearing on all questions relating to a business to the prosecution of which he has devoted the best part of a lifetime.—*Home Journal.*

Sowed Corn for Fodder?

Keep it before the farmers? What? The fact that corn fodder, either sowed or drilled, is the best winter feed for cattle. How do I know? I will tell you. Four years ago I read the fact in my paper, and for three years it has been the largest part of my winter feed. Now, I know that my cattle will give more milk and will gain faster in flesh on this than on any other feed, grain excepted. I pride myself on having as good hay as any one. As I have but little to cut, I put it into the barn as nice as possible; yet I never had hay nice enough to tempt the cattle from the corn fodder. My method of raising is very much the same as others. Make the ground rich with manure if you can, and be sure it is mellow; sow the seed as early as possible after danger of frost is past, and be sure and cut it before it is injured by the frost in the fall. In brief, whatever you do, do it in season and in the best manner possible. This rule will apply to almost any crop. The Editor wishes the cost of crops raised. Here are my figures on sowed corn. I will give the cost and product of one acre which was manured:

Dr.	
Interest on one acre land.....	\$3 00
Hauling 30 loads manure.....	8 00
Ploughing one day.....	3 00
Harrowing and rolling twice.....	3 00
Seed (1 1/2 bush.) and sowing.....	1 00
Cutting up corn (4 days).....	5 00
Total cost.....	\$22 00

Cr.	
Five tons corn fodder (\$18 per ton).....	\$90 00
Cost	22 00
Profit	\$68 00
Two acres which were not manured raised:	
Three tons fodder.....	\$54 00
Cost of raising and cutting.....	24 00
Profit.....	\$30 00

We have here a good example of the relative profit of a good and poor crop. Although the cost of the acre which was manured was nearly double that which was not, yet the profit was more than 4 1/2 times greater.

It was my intention to have weighed the fodder from the acre which was manured, but owing to the very heavy snow of October and November, I could not get the true weight, so I omitted it, but have endeavored to keep my statements true to the facts. Corn fodder, properly raised and cured, I consider worth as much, if not more, than hay; but I have figured it \$2 less per ton, hay being hard to find at \$20 per ton.

I object to putting on as much seed per acre as some recommend. Where 3 to 4 bushels are used the corn is so thick as to exclude the air and sun to such degree that the fodder is white and sickly-looking underneath, and does not contain near the nourishment of that more exposed to the light and air.—*Cor. Rural New Yorker.*

THOMAS BATES, the renowned breeder of Short-horns, used to say that hundreds of men could be found fit to be Prime Minister of England, to one who could be a successful breeder of Short-horns.

Mr. JAMES L. SCOTT, farmer, Sprague's Road, has a ewe which has given birth to six lambs, and is not yet quite two years old. Last spring she had three, and this spring she has repeated the operation. Five of the lambs are living and healthy. The same gentleman informs us that each of three of his ewes last spring brought forth three lambs. These ewes are not for sale, says the *Galt Reformer*.

FAT CATTLE.—On Monday last Mr. Waugh, of South Dunnies, sold seven head of fat cattle to Mr. Wheeland, of Galt, for \$330 cash, and Mr. Lock sold ten head on the same day to the same party, at \$4.50 per 100 lbs. Mr. George Armstrong sold a fat heifer also to Mr. Wheeland for \$51. The above cattle were shipped for the Buffalo market on Monday last.

HOW TO FEED RYE.—We have fed rye to horses and cows as green fodder, cut when coming into ear, in which state it is very excellent feed. To feed rye that has been cut ripe, we would thrash it, grind the grain along with corn or oats, cut the straw in a fodder cutter, moisten it with water, sprinkle a handful of salt and three quarts of the ground feed upon a large pailful of the moist cut straw. This makes a very good feed for an ordinary sized horse when working moderately.—*Am. Agriculturist.*

Poultry Yard.

The Wild Duck or Mallard.

The common or domestic duck is admitted by all naturalists to be descended from the wild duck or mallard, which is distributed widely over the continent of Europe and the greater part of North America. The characteristics of the wild duck, as described by naturalists, is a flatish broad bill longer than the head, not contracted or much dilated towards the tip, and not much elevated at the base; destitute of a tubercle at the base, the denticulations of the upper mandible scarcely projecting beyond the margin, and a short and rather pointed tail of sixteen feathers. The male of the common duck has the four middle tailed feathers recurved. The beautiful plumage of the wild mallard drake is best represented in the Rouens, which will be more fully described in a paper on that breed, and which exhibits greater brightness of plumage, during the breeding season at least, in the wild than in the domestic variety. At the close of the breeding season the wild mallard drake assumes for a time, as does also the drake of the Rouens and some other varieties, a plumage more sober and resembling that of the female, but before winter sets in the splendid plumage proper to his sex is again acquired. The range of the mallard or wild duck is said to be very extensive—from the vicinity of the pole in summer to almost the torrid zone in winter. On the approach of cold weather it regularly emigrates towards the south, returning again with the summer to the more northern regions, in which it rears its young. In America it is to be found as far southward as Florida, where it is abundant, and in the West Indies, although in the Old World it is not known as belonging to the regions of similar climate. Alluding to the change of plumage of wild mallard, Waterton thus describes it: "About the 24th of May the breast and back of the drake exhibit the first appearance of a change of color. In a few days after this the curled feathers of the tail drop out, and grey feathers begin to appear amongst the lovely green plumage which surrounds the eyes. Every succeeding day now begins marks of rapid change. By the 23rd of June scarcely one green feather is to be seen on the head and neck of the bird. By the 6th of July every feather of the former brilliant plumage has disappeared, and the male has received his garb like that of the female, though of a somewhat darker tint. In the early part of August this new plumage begins to drop off gradually, and by the 10th of October the drake will appear again in all his rich magnificence of dress, than which scarcely anything throughout the whole wide field of nature can be seen more lovely, or better arranged to charm the eye of man." The dates here given are of course subject to some little variation, as Waterton observes, but much less so than many would suppose. In reference to their habits we take the following from the *Illustrated Book of Poultry*—

"Marshes and fens, as is well known, are the chief resorts of the wild duck; and drainage and other forms of cultivation have now driven it away from many an old favorite haunt where it was formerly a regular and welcome visitant. To others, however, it still comes in large numbers, and is taken by various species of decoys, or shot by hundreds, especially in Lancashire. About March it pairs, the wild bird being strictly monogamous, and soon after begins to breed, the duck usually laying from seven to ten eggs, and making her nest of flags or sedges somewhere near the water, if there be a small island, it is eagerly taken advantage of. As soon as the duck begins to sit, Waterton says, the drake leaves her, and joining the others, begins the curious moult which we have already described. Later on, when the young are partly grown, the male rejoins his family, and several often unite to form one flock.

They then remain together till the autumn, when the whole colony fly in consort to their warmer winter quarters. During this immigration they generally fly in long lines, in the shape of the letter V, the dressing being nearly as accurate as in a regiment of soldiers; but the formation is frequently broken up, when the birds get into a confused mass. It will be seen that this mode of flying is more or less common to all the water-fowl. The duck sits for twenty-eight days, except some of the smaller varieties, which hatch in less. She usually sits with the greatest steadiness, and on leaving the nest always covers her eggs very carefully with leaves or other substances. Whether this is done for concealment or to protect them from the cold is somewhat uncertain. Wild ducks have often been domesticated. The usual mode is to obtain eggs and hatch them under tame ducks or hens, when they are brought up with no difficulty, though of course there is some wildness of disposition. It is also generally found that down to even the third or fourth generation such domesticated wild drakes pair strictly like their ancestors, instead of taking a small harem like the domestic variety. When thus domesticated, the progeny after a while almost always begins to vary in color."

Dominiques.

Dominique fowls have of late years been lost sight of somewhat, in the race among fanciers to procure newer and more fanciful stock; this is to be regretted, for as generally useful fowls, the Dominique is equal to any we know of. Purely an American fowl, one would naturally look for the best specimens in its native home, but all our poultry breeders agree that it would have been easier to procure good specimens ten years ago than at the present time. Bement says



Dominique Fowls.

in speaking of the Dominique fowl, that if well selected and carefully bred, they are fine and useful birds. They are distinguished by their markings and their color, which is generally considered an indication of hardiness and fecundity. They are by some called "hawk-colored fowls," from their strong resemblance in color to the birds of that name. We seldom see bad hens of this variety, and take them all in all, we do not hesitate in pronouncing them one of the best and most profitable fowls, being hardy, good layers, careful nurses, and affording excellent eggs and first quality of flesh. The Dominique closely resembles in general characteristics a rose-combed Cuckoo Dorking with four toes, but with brilliant yellow legs. The comb should be a neat rose resembling that of the Hamburg, with the face wattles and deaf ears red, the legs a bright yellow, and the plumage composed of a light bluish-grey ground, crossed with bands of a darker grey or blue, the size medium, and shape that of the Dorking, from which it is said to be a descendant, the average weight about seven to eight pounds in adult cocks, and six pounds in hens. Mr. Wright says, "the shade of color varies, the darker bands in some specimens being nearly black; but a medium color is preferable. Whatever the shades, however, the hackles and shoulders of the cock should partake of

the same character, and be free from reddish or golden feathers, which are blemishes very apt to occur, but which may be guarded against by careful breeding." These remarks, with the description of the plumage, will equally apply to a large class of poultry. Cuckoo Dorkings, Cuckoo Codines, Anconas or Cuckoo Spanish, Cuckoo Polish, Gueldra or Cuckoo Bredas, Scotch Greys, &c., all have this plumage, which differs from that of pencilled Hamburgs, to which it bears some resemblance in the transverse character of the markings, in that the pencillings or bars are much larger or coarser; and more essentially (since size of marking could soon be modified by breeding) in the bands being in this case shaded gradually dark into light, instead of presenting the sharp contrast of marking and ground shown by what are called pencilled birds. The Dominique is an excellent layer, very hardy, and good for table. It grows fast, feathers quickly, while its plain homespun suit makes it very suitable for countless localities where more showy or valuable-looking fowls would be imprudent or out of place. As a layer it is superior to the Scotch Grey, and to the Cuckoo Dorking in both this point and hardiness as well. In describing the color of the Dominique fowl, Bement in his *Poultry Companion*, says "the prevailing and true color of Dominique fowl is a light ground, undulated and softly shaded with a slaty-blue all over the body, forming bands of various widths. The comb of the cock is variable, some being single while others are double; most, however, are single." It will be seen from this how irregular Mr. Bement's specimen types bred in his day, and shows that no regular well defined principle was adopted, otherwise double and single combs would not occasionally appear. "The iris of the eye," says the same authority, "bright orange; feet and legs flesh-color, some, however, are of a bright yellow or buff color; bill, the same color as the legs. The hens are not large, but plump and full breasted. The cocks are somewhat larger than the hens, some approaching to the smaller sized Dorkings in weight. The chickens, at two or three months old, exhibit the barred plumage even more perfectly than the full grown birds. The eggs average about two ounces each, are white, and of porcelain smoothness. The newly hatched chickens are grey, with a dark stripe down the back of the neck and three on the back, resembling those of the Silver Poland, except in the color of feet and legs. The Dominique fowl supplies an unfailing troop of good layers, though not quite so early in the season as the Asiatic and some others; they are good feeders, good setters, good mothers, hardy, and are well worthy of promotion in the poultry yard."

Dr. Bennett, in his *Poultry Book*, says, "I know of no fowls which have stood the test of mixing better than the Dominique." "The best mode of breeding the Dominique," says Mr. Wright, "is to select hens of a pleasing medium shade, such as that desired, and to put with them a cock slightly darker, carefully avoiding birds with either red or black feathers, and as far as possible, even hackles of a golden color; by which means, with a little patience, a strain may soon be found that breeds a pure blue-grey. The most difficult point is to get enough depth of color in the cock without obtaining sickles or tail-coverts nearly or quite black; hence it is necessary at first to raise as many chickens as possible from the first stock, in order to have plenty of material for selection. Besides the color, the neat-rose comb, red earlobes, and brilliant yellow legs, with fine shape and size, are all that need to be attended to in breeding Dominiques." In the *American Standard of Excellence*, the general shape and color is thus described: comb, rose, large, bright red, similar to Hamburgs. wattles, red, well rounded, medium length; beak, yellow, leg, yellow; deaf ear, red; plumage, a light blue ground, shaded with a dark slaty blue all over the body, forming bands of various widths. There is little doubt that the Dominique was one of the parents which produced the Plymouth Rock, described in a recent number of this journal, crossed with some of the Asiatic breeds of fowls.

Poultry Notes.—No. 8.

Treatment of Hatching Hen.

The desire for incubation in the hen is involved in as much mystery as are several other operations of nature; but whatever the cause from which it proceeds, it is a wise provision, although it sometimes causes much annoyance and inconvenience to the poultry-keeper. Much of the success in hatching chickens depends on the breeder's knowledge of the proper treatment of the hatching hen during incubation. In their natural state, fowls will seek a sheltered nook or corner, and there make their nests and hatch their young; and therefore it has been argued by many that this is the only true way to raise chickens successfully. But it ought to be borne in mind, that fowls in this state seldom commence laying till late in the season, and when the state of the weather precludes any possibility of their eggs and young being injured by cold; neither will they lay more than one brood in the season. It is different with poultry as now bred, either by farmers or fanciers. The domestic fowl of the present day is an artificial bird, and therefore requires artificial treatment; to follow nature, then, would be to give up all idea of obtaining eggs or profit from poultry-keeping. It is not one brood of chickens from one hen we want, but several; and to thoroughly understand how to produce these, and yet keep fowls in a perfect state of health, is one of the great secrets of poultry-keeping.

The place selected and the hen comfortably fixed, she must be allowed to remain quiet for some time; food and water should be placed near her, and her excrements removed daily. In cold weather she should not be allowed to be absent from the eggs more than a few minutes at a time, and even in warm weather, twenty minutes will frequently addle all the eggs, but we have frequently allowed hens to remain off fully half an hour in warm weather and no injury to the chicks occurred. In the early stages of hatching, eggs are more liable to be addled than at a later period, that is during the first two weeks. Animal life in its simplest form of existence can be maintained at a much lower temperature than in a higher; and for this reason, at the earlier periods of hatching the sitting hen may be absent for a prolonged time without injury, whereas a much shorter neglect of her duties would be fatal near the day of hatching. There are, however, exceptions even to this, and it has been proved that in ordinary weather eggs will survive even a very long absence of the hen. It is related by a poultry writer, that he had a hen which was absent several hours in the middle of hatching, and still brought out a fair number of chickens; and on another occasion, the very last day of incubation, the hen absented herself so long that the eggs became really stone cold. The particulars of the case are worth relating. At the end of nearly three weeks the hen manifested the unnatural vice of breaking the eggs and eating the nearly developed chickens, and finally abandoned the nest altogether. An absence of several hours occurred before this was discovered, and the eggs were then stone cold. They were immediately gathered from the nest, with, of course, little hopes of ever realizing chickens, and placed in a vessel of water heated to fully 105 degrees, whilst another hen was being procured. In about ten minutes six of the eggs showed signs of life, and eventually hatched out. We could relate other instances of a nearly similar kind which occurred with hatching eggs of our own, but the above is sufficient to prove the exception, and should act as a warning to all breeders not to arrive too hastily at the conclusion that valuable eggs may be lost, even if they do get chilled. From whatever reason, if eggs explode at the end of the period of hatching, or are decomposed or in any way changed in color, it proves that they have been fertilized and began to hatch, and had their vitality destroyed by some means or other. This may have

occurred in several ways; fecundation may not have been sufficiently strong, to produce chicks; the eggs may have been chilled before being gathered from the nest when laid, or the sitting hen may have been inattentive to her maternal duties, and during the process of hatching became chilled. In any such case, chickens would not hatch. Barren eggs remain a clear yellow to the last, and only emit a strong musty smell.

Too many hens should not be allowed to sit in the same house or pen. From this arises another fruitful source of bad hatching. Hens are of a perverse inclination, and frequently go to the others' nest instead of their own. Each hen should therefore have a pen entirely to herself, and it should be large enough to admit of a dust pan, and pans for food and water to be placed inside. Lut when hens are shut up in this manner on their nests, they ought to be removed daily, and watched to see that each returns to her own nest again, and not remain away too long at a time. Close attention ought to be given to hatching eggs at all seasons, but especially at this time of the year; particular care should therefore be paid to the nests, as if made on the ground, the eggs may get chilled. A good plan in such a case would be to put a shovelful of dry ashes under the nest, as already hinted, and about four days before hatching pour some boiling water close round the nest on the ground, that is if the weather is not frosty so as to freeze the water into ice. The treatment of the eggs in warm and dry weather will be different, the moisture of the eggs will be evaporated, which renders the chickens unable to crack the shell in half, and consequently unless assisted will perish. On this point Mr. Wright says, "attempting then to keep the nest and eggs dry, however useful in winter, in summer loses many a brood. Hence it is often advised to sprinkle the eggs daily with water in summer time, and we formerly always adopted this plan, but finding occasionally bad results follow it, careful examination showed, that in some circumstances (probably) chiefly depending on the hay (or straw) parasites so small as to be only distinguished by the microscope swarmed over the shells, and were probably the cause of the failures * * * If we make a straw nest, our usual plan is to take the hen off about a week before hatching, and empty a full half pint of warm water over the nest and eggs, repeating this the third day after, and once more before the eggs are chipped. But all this refers only to dry weather; if not warm or dry, watering the ground is quite sufficient. Damping the eggs should always be done at night, in order that the hen may be immediately replaced on them."

We have already noticed the benefit to be derived from setting two hens at the same time in the case of sterile eggs. Another advantage to be gained is that all eggs under the same hen, owing to several cases, may not hatch out at the same time, all the unhatched eggs may then be given to one hen and the chickens to the other, which will be advantageous to both; the chickens in the one case will be better brooded, and in the other case the eggs better hatched. If all eggs set are fresh, of course the difference in hatching time will not be long, and this trouble may be obviated. It sometime happens that an egg may be cracked during the process of hatching, and, if valuable, some remedy should be adopted to preserve the chicken, if it appears that there is one in it. In such case paste a narrow slip of gummed paper over the crack, and the probability of hatching successfully is greatly in its favor. The last time the hen is taken off the nest, she ought to have a good feed of grain. She will then stay quiet during the time the chickens are hatching out. Occasionally the eggs should be examined, and the shells of them already hatched removed, and if any need assistance it should be given them. "We formerly," remarks Mr. Wright on this subject, "made many attempts at such assistance in vain, and like many others rushed to the conclusion that chicks could not be thus saved; but an accidental discovery put another face on the matter. Keep the egg in warm water (about 100 degrees) while the assistance is being rendered, and success may be hoped for. The shell must be cracked very gently, and the inner membrane very tenderly peeled off, till the chick be at liberty, keeping all but the beak under water till nearly clear. The operation must be performed in a warm place, and tenderly as if touching raw flesh; and it will be found that the water greatly facilitates matters, liberating the membrane if glued to the chick, and enabling it to be separated without loss of blood. The latter occurrence nine times out of ten is fatal, but if the operation be completed without blood flowing success may be anticipated, and the nearly dead chick may be put by the fire in flannel, or under the hen if a quiet good mother,

under her at night in any case, and next day may probably be as well as the others. We have latterly often saved chicks in this way, when before using the warm water we always failed; and when hatching eggs of first quality, any pains to save an extra bird are worth while."

Eggs by Weight.

The Legislature of Massachusetts has lately passed a law making it necessary that a dozen eggs weigh one and a half pounds. This is a move in the right direction, and we hope that all the other States may speedily follow the good example set by Massachusetts. It is annoying to the breeder of blooded and fine fowls to find, when he offers for sale eggs nearly twice as large as his neighbors, that they bring no more per dozen than do the smaller ones. Also, the consumer is often vexed to find that he must pay the same price to-day for a dozen eggs weighing but a pound that he yesterday paid for a dozen weighing a pound and a half. Besides, an egg from a well fed fowl is heavier and richer than an egg from a common fowl that is only half fed, so weight compared to size is a combination of richness. Thus, eggs of which eight will weigh a pound are better and richer than those of comparatively the same size of which ten are required for a pound. Of course, with eggs at three or four cents a dozen—and the writer of this has seen hundreds of dozens sold at these figures—it is not much matter as to the size; but when the prices range from twenty-five to sixty cents per dozen, it is a matter worth looking after. It is high time that this old style of selling and buying poultry and eggs by the piece should be discontinued. It is a relic of the past and reminds us of the time when dressed hogs sold for \$1 each, without regard to size or condition, and were a dull sale at that. Insist upon it, then, you who raise poultry for the market; insist upon it, then, you who have to buy eggs for consumption; insist upon it, all ye rich and poor, high and low, that eggs be sold for so much a pound. Then it will be some inducement for farmers to raise a better class of fowls, and all will get their just dues. Then the enterprising breeder and poultry fancier will receive the reward of his efforts to furnish a market fowl of good size and of such a degree of fatness that it shall be eatable, and the breeder of poor, half-starved specimens will no longer be his successful rival.—*Flint (Mich.) Globe*.

Dust Baths for Poultry.

Cleanliness is important in fowl-houses, for experience shows that poultry are unfavorably affected by the emanations from filthy quarters, and, besides, working in places where roosts and floors are covered with the droppings is decidedly unpleasant. Dry earth, in the form of powder, scattered everywhere, will absorb the bad odors, giving a wholesome atmosphere to the hen-house, and at the same time preserve the manure in the least offensive condition. Besides these purposes, a box of dry earth should be in a convenient corner of every fowl-house for the fowls to roll in. Dust from the highway is the most convenient. Replace the same by an equal quantity of good gravel, and the public will be the gainer.—*Live Stock Journal*.

HUGE EGG.—A Spanish hen, owned by Mr. Wakeing, of Westminster, has furnished that gentleman with a breakfast in the shape of an enormous egg. It measures in circumference 8½ inches by 6½ inches, and turns the balance easily at a quarter of a pound.

DOMINIQUE FOWLS.—The *London Field* says of this variety, which it denominates American:—

There are two or three useful and good breeds of poultry that are not well known in England. One of the oldest established, and certainly one of the most useful, is the Dominique. This breed more closely resembles our Cuckoo Dorking than any other English variety. It differs, however, in having only four toes—a great advantage, by the way, in a practical point of view—and in the legs being yellow. Each feather is of a very light gray, barred across with darker slaty-blue bars or pencillings. The Dominique cocks are showy birds, with full saddles and hackles, and abundant, well matched sickle feathers. They should weigh from six to eight pounds when mature. As table fowls, they should necessarily be short-legged, full-chested, and broad on the back. The ear lobes should be red, and the wattles and comb neat; the former of medium size. The merits of this breed will recommend them to persons residing in the country, as well worthy of promotion in the poultry-yard, whether as makers of eggs, or of meat; as sitters, or nurses, they are invaluable.

Poetry.

"Out West."

[The following parody, which is circulating anonymously through the press, has a world of sense in it, and is respectfully dedicated to those unsatisfied persons for whom Canada is not good enough, but are continually spying out a better country. —]

I hear thee speak of a Western land,
Thou callest its children a wide awake band;
Father, O, where is that favored spot?
Shall we not seek it and build a cot?
Is it where the Alleghenies stand,
Whence the honey comes already canned?
Not there, not there, my child.

Is it where the little pigs grow great
In the fertile fields of the Buckeye State,
And get so fat on acorns and meal
That they sell every bit of them, all but the squeal?
Where the butchers have such plenty of hogs
That they don't make sausages out of the dogs?
Not there, not there, my child.

Or is it where they fortunes make,
Where they've got a tunnel under the lake;
Where the stores are full of wheat and corn,
And divorces are plenty as sure as you're born;
Where long John Wentworth is right on hand,
Is it there, dear father, that Western land?
Not there, not there, my child.

Is it in the domain of Brigham Young,
The most married man that is left unbung,
Where every one that likes can go
And get forty wives or more, you know?
Where saints are plenty and cheek sublime—
Can that be the gay and festive clime?
Not there, not there, my child.

Is it where Colorado's mountains rise
From the boundless plains where the buffalo lies,
Where the air is pure and the waters cool,
Where fortune favors oft times the fool,
Where the rocks are full of the precious ore—
Is it there we'll find that Western shore?
Not there, not there, my child.

Eye hath not seen it, thou verdant youth;
Tongue cannot name it and speak the truth;
For, though you go to the furthest State
And stand on the rock by the Golden Gate,
They'll point out across the Western sea
To the land whence comes the Heav'n Chinee,
Saying, "Tis there, my child!"

Miscellaneous.

How the Ingredients of the Soil can Easily be Ascertained.

A vigorous farmer will seek to ascertain exact knowledge of the ingredients of his soil, and thereafter seek to improve the same. Whoever has attained this degree of knowledge may often do more toward these improvements with a few loads of sand or a few sacks of lime, than large numbers of loads of manure could further it. But how to obtain the necessary knowledge?

It is true, would a farmer minutely ascertain what and how much of every ingredient his soil contains, it would require of him a knowledge that generally only good and experienced geologists possess. But this is not at all absolutely essential, the necessary knowledge a farmer can obtain far easier. The color, smell, or even the handling of a handful of earth will teach him the first lesson—what species of earth his acre contains. If it feels rough and grainy, and will, in a wet condition, not knead, it is a sign that it contains much sand; is it smooth and slippery, and will knead and allow itself to be formed into any shape? it means clay; will it blister and ferment on application of very strong vinegar? it indicates lime. The black color of the earth speaks for good and productive soil. More minutely can the substance of the ingredients be arrived at in the following manner:

Gather from different localities in the field so much of the soil as the real productive soil reaches down; mix it well, dry it and put it up in a box, and set it aside until you have leisure for examination. This may be done in the winter. For the operation get a scale, a fine (close) sieve, a couple of fireproof pots, some acid of salt (muriatic acid), which can be had at every drug store at trifling expense. All in readiness, sift the dry earth in order to free it from roots, gravel, &c., and weigh off a pound of it, and deposit in one of the pots, and set it for a couple of hours on red hot coals. This done, and when the earth has grown out, weigh it again, and whatever it has lost in weight is the genuine productive black soil; for this has been consumed by the heat. Mark down

the figures of the weight. The remaining earth in the pot is now to be mixed with water and stirred. Through this experiment, first the coarse and then the fine grained sand will settle to the bottom, while the clay and lime will have dissolved and swim. After settling, the slimy water must then be poured gradually into the other pot, and the remaining sand dried and weighed. There is the portion of sand which will again be noted down.

Next for the clay and lime. To this end take your acid, and drop by drop apply it to the slimy liquid in the other pot, until it ceases to ferment. Through the application of the muriatic acid is the carbonic acid of coal extinguished or forced out, causing the fermenting; the lime stays dissolved, while the clay settles to the bottom of the pot. Has the liquid cleared off again, pour it off, dry the clay and weigh it. Add up these figures, and what is lacking of the pound is about the percentage of lime.

If the farmer tries such experiments in the winter days, takes his boys to help him to mark down and figure, and teaches to them these lessons, it is just as interesting as it is useful. The boys will the next season try the experiment themselves, mark everything carefully, from which spots, &c., the earth was taken, and await impatiently for the time when to resume their studies. Everything marked correct and careful, the farmer will without sacrifice of valuable time ascertain the condition of his acre.

This is a little piece of chemistry, and our future generations will doubtless study it much more than the present one, and it will perhaps wonder how we could prosecute husbandry without more knowledge of this particular branch of science.

In conclusion, a few specifications for the better better discernment of wild lands may not be out of place, as in no country so much as just in our own is the farmer liable to come into situations where it is of the greatest importance and value to him, that he should be able to judge raw lands as well as cultivated and improved.

1. Wherever good timber grows the soil is capable of producing good grass and grain.

2. Where timber grows in great variety, there the soil will also bring forth all kinds of grain, vegetables, fruit, vines, &c., so that the farmer is not forced to raise always the same sort of produce, which would soon exhaust the fertility of his acre.

3. Where the roots of trees appear to spread much, directly under the surface, instead of growing downward, there is an indication of rock bottom, with only a thin layer of good, productive soil.

4. Where many ponds of standing water appear, there is generally to be found too much of tough clay, that permits no water to go through, and which often frustrates all efforts at successful cultivation.

5. The different beds or layers of the earth can be seen in deep splits, or on the banks of creeks.

6. Crippled and poverty grown timber indicates poor soil, without regard to the mixture of it, and also indicates the absence of the quality known as waterishness or inspidity.

7. Thin and at the same time too tall trunks of trees are a pretty positive sign of a too watery soil and bottom; and when standing on the banks of rivers, on the bark of the trees is to be seen how high the waters therein rise and overflow the adjacent country; and in such cases whether it is safe to live and build on certain localities, &c.

8. Luxurious and close growing grasses on level ground is an unmistakable sign of rich and fertile soil, such as is generally found on the wide prairies of the States and Territories of the West and North-west.—*Rural New Yorker*.

Wastefulness in Farming.

This is generally the result of a want of system, and it also originates in ignorance, carelessness and laziness. Sometimes a farmer will raise so large a crop of one thing that he cannot save it.

I once knew a very energetic farmer injure his whole crop of oats by stacking it too soon. He noticed that the stacks shortly after being put up, had settled down very much, and when he put his hand into one of them he found it very hot, so much so, that when he collected his laborers to pull down the stacks, the oats were so hot as to burn, and in some instances to blister the hands. But he got the stacks taken down and the oats scattered about so that the air could circulate among the sheaves, and they soon got cool and dry enough to put again into the stack. The oats were really as good as ever for feeding purposes, but were useless for sowing, as the germ had been destroyed by the heat.

I was out a short time ago in one of my neighbor's co-fields. He had employed a good many hands to shake out his crop of corn, and they had got out over one hundred shocks when a cold freezing spell put a

stop to the work. He left his corn in this condition for several weeks, lying on the ground exposed to rains, snows and thousands of crows and other birds; and about twenty of his own hogs were trying to get their share before the crows got all. In the same field I saw a wheat-fan that looked as if it had been standing in one place for two years.

It is a very common thing for ploughs, harrows, hemp-hooks, reapers and mowers to be left out in the fields for a year, until they are wanted for the next crop. A farmer ought to have a place for everything, and everything in its place; ought to see all the stock on his place every day, and he should at least once a week go round his farm and see that none of his fencing has been left down. Some persons may ride through his farm at night, and leave his fences down, and a large number of cattle, mules and horses may get into his corn-field and do great damage.

There is another great wastefulness which will yet be felt in this country. I refer to the wasting of manures on the farm. Not only the stable manures, but other fertilizers are suffered to go to loss. Large quantities of corn are fed to hogs in a small pen on a hill side with a branch running through it to afford water for the hogs. The first hard rains of winter wash all this valuable manure into the branch, and it is thus taken off the farm. How much better would it be to have fed this corn on the poor spots in the field which is to be cultivated the next year. In the same way the stalk fodder which is raised on one field should be fed on another which will afterwards be put into cultivation, and should not be fed in the blue grass pastures or in the woods, which are already rich enough. Beside, it injures the blue grass very much.

There is not much waste in a corn crop if it is gotten up clean off the ground when it is cut, and put into good shocks, and then gathered and "housed" before Christmas. For even if a good quantity be left in the shock at shucking time the cattle will find it in the fodder. But corn which is left out all the winter for feeding cattle, is much wasted by rotting and by the crows. Some farmers prevent this by going to each shock and shucking out the corn which is exposed on the outside, and will thus save five or six bushels per acre, which would otherwise be an entire loss. The wheat crop is very much wasted. First, in cutting some is lost; then in binding much is wasted; some in stacking, and some again in threshing and hauling to market; but not much is wasted by sowing too much per acre, and that is why the yield is only 12 or 15 bushels per acre when it ought to be 25 or 30.—*Home Journal*.

The Farm Hand of Thirty Years Ago.

There lived some twenty or thirty years ago in New England a race of men, American born, and who, having gone through a two winters' course of district school ciphering and reading, became the most indefatigable and ingenious of farm workers. Their hoeing was a sleight of hand; they could make an ox-yoke, or an axe-helve on rainy days; by adroit manipulation, they could relieve a choking cow, or, as delfty, hive a swarm of bees. Their furrows indeed were not of the straightest, but their control of a long team of oxen was a miracle of guidance. They may have carried a bit of Cavendish twist in their waistcoat pockets; they certainly did not waste time at lavations; but as farm workers they had rare aptitude; no tool came amiss to them; they cradled; they churned, if need were; they chopped and piled their three cords of wood between sun and sun. With bare feet, and a keen-whetted six-pound Blanchard, they laid such clean and broad swaths through the fields of dewy herdsgrass as made "old-country-men" stare. By a kind of intuition they knew the locality of every tree, and every medicinal herb that grew in the woods.

Rarest of all which they possessed was an acuteness of understanding which enabled them to comprehend an order before it was half uttered, and to meet occasional and unforeseen difficulties with a steady assurance as if they had been an accepted part of the problem. It was possible to send such a man into a wood with his team, to select a stick of timber, of chestnut or oak, that should measure a given amount; he could be trusted to find such, to cut it, to score it, to load it; if the gearing broke he could be trusted to mend it; if the tree lodged he could be trusted to devise some artifice for bringing it down; and finally for its sure and prompt delivery at the point indicated.

Your Irishmen, on the other hand, balks at the first turn; he must have a multitude of chains; he needs a boy to aid him with the team, and another to carry a bar; he spends an hour in his doubtful estimate of dimensions; but "begorra, it's a lumpish tree," and he thwacks into the rind a foot or two

from the ground, so as to leave a 'nato' Irish stump. Half through the hole he begins to doubt if it be indeed a chestnut or a poplar; and casting his eye aloft to measure it anew, an ancient woodpecker drops something smarting in his eye; and his howl starts the ruminating team into a confused entanglement among the young wood. Having eased his pain and extricated his cattle, he pushes on with his axe, and presently with a light crash of plant boughs, his timber is lodged in the top of an adjoining tree. He tugs, and strains, and swears, and splits the helve of his axe in adapting it for a lever, and presently, near noon, comes back for three or four hands to give him a boost with the tree. You return—to find the team strayed through a gate left open, into a thriving cornfield, and one of your pet tulip trees lodged in a little young hickory.

"Och! and it's a tulip it is! and I was thinkin' 'twas niver a chestnut; begorra, its lucky thim, it didn't come down intirely."

These and other such replace the New Englander born, who long ago was paid off, wrapped his savings in a dingy piece of sheepskin, scratched his head reflectingly, and disappeared from the stage.—*My Farm of Edgewood.*

Experimental Farms and Gardens.

We do not know of anything which would be more interesting on a farm than a small experimental ground. New plants and seeds come into notice every year, but only a few know which are most valuable, and the great public depends on the newspaper editor, some interested correspondent, or the reports of some agricultural society to tell him all about them. Finally, the strength of what he reads, he invests considerable money in some article or another, plants considerable ground with it, and finds out only when too late that it is not at all suited to his climate or soil.

It oftentimes happens that an article really good in a majority of cases is of very little value in some particular spot. This is just the sort of knowledge no paper or society can teach, but which a small experimental garden would readily supply. At market, or when visiting friends, one often has a few seeds or roots given him which may be very useful to him, but which is lost chiefly because there is no spot assigned for the testing of these things. There is indeed a disposition in many cases to regard these presents of new things as bores, and they are often accepted because it is not thought courteous to wound a friend's feelings by refusing what he regards as somewhat of a treasure. We once knew a friend who always felt this way. Many a thing he had accepted and then threw on the rubbish heap. On one occasion he had half a dozen Early Goodrich potatoes given him. But these he happened to plant in his garden, without, however, blessing much the hand that gave them to him. But he was struck with their beauty and productiveness—it happened to be one of those years when that variety did wonderfully well—and the next year had a considerable tract of them. It was at a time when this variety was bringing almost fabulous prices, and his profits on his friend's gift were tremendous. Of course one would suppose after this he looked well after these odds and ends of new notions as they came before him; but the lesson profited him not. He had no regular place to put things, and never thought to make one. No doubt he has lost many a good chance equal to the Early Goodrich one.

But besides the pecuniary value which often results from trying experiments, there is a great amount of pleasure from watching things grow that we never saw before; and we are well assured that no one who established a small experimental ground on his farm could ever after be without it.—*Mass. Ploughman.*

Flax Culture.

In this locality, it has been our practice invariably to sow at the last quarter of the moon in May. For one acre, one bushel of perfectly clean seed is plenty. Sow evenly; to do this, sow both ways, taking a still time when there is no wind. Be careful not to fill your hand too full; otherwise you may lack seed at the cross sowing. The land should be a sandy loam, that was planted to corn or potatoes and well manured the previous year, and kept clean from weeds; ploughed fine and smoothed evenly with a fine-tooth harrow; then sowed as directed and covered with a light brush. The time to harvest is when the bolls are well filled and begun to turn yellow. Pull and keep the butts even; tie up in small bundles; set up in small stooks; and when perfectly dry,

draw to the barn and put away in the stables adjoining the barn floor, thrashing at some time before your second harvest comes on. Have your barn floor swept perfectly clean; take a five-pail iron kettle or an empty barrel, place it in the middle of your barn floor, and set the boys to whipping the bound bundles over the edge of the barrel or kettle, keeping the butts even; throw the threshed bundles out in your yard, and if it rains on them before spreading, all the better. Rott'ing by spreading is our practice. (We have never tried water-rotting in ponds.) Draw out on a smooth, dry meadow, well protected from stock of all kinds; then commence spreading on the upper part of the meadow. One man to turn and "handful" out, and one man to follow and spread, are sufficient. Keep the butts even and spread smoothly; no lapping of one gavel or row on another is allowed. When rotted nearly enough, turn over the gavels with a pole eight or ten feet long, running it under the tops and turning it over. If grown for seed, we get twelve bushels from a bushel of seed-sown. When rotted enough, rake up in good sized bundles and bind; keep the butts even, and draw to the barn on a very dry day; pack away over your barn floor under the roof.

A word as to "getting out flax," as they call it here. When March comes, have your "break" and "swinging board" and "swinging knife" ready, and go at it (a dry day is best); unbind and "handful out," and let the sun slum upon it a little. Finish it all if you can this month. A barn full of flax and no hay the first day of April is rather a poor sign in this locality.—*Cor. Country Gentleman, Mass.*

Working Cattle-Yokes and Bows.

With working cattle, one of the most important requisites is that they be as well housed and fed as you would horses. It is true they need not be blanketed, neither need they be fed so much concentrated food as horses, but good care and feeding pays as well with working oxen as horses.

Another point for consideration is the desirability of yokes as compared with harnesses. While we concede the value of harness for the waggon, the yoke has so many advantages in other directions, as in logging, ploughing, etc., that we think it will not be soon superseded.

The proper shape, length and construction, therefore, of the yoke is of importance. For medium-sized oxen, the whole length of the yoke should be three and one-half feet; the distance between the bow holes inside, should be twenty inches; the distance between the outside and inside bow-holes, six and one-half inches. This would give as the distance from outside to outside of the bow-holes, thirty-three inches, leaving four and one-half inches on each side of the yoke beyond. The bows, as to length, must be proportioned to the neck of the oxen, being somewhat oval in form, the swell about one-half of the way between the bottom of the yoke and the bottom of the bows, or, where the ox's shoulders come; the bows when formed to be not less than one and a half inches thick. The staple and ring should be placed in a direct line with the holes for the bows and equi-distant between the inside holes, unless one of the oxen is much the stronger, when it must be varied so that the weaker animal may have the longer end of the yoke.

The proper form for a yoke cannot be described in words. The workman must get a good model to work from. Yellow birch, beech or maple make good heavy yokes; for ordinary work, basswood (linden) is both easily worked and makes a good light yoke. If thoroughly oiled after being made, and this be repeated occasionally, it will last indefinitely. With basswood, six inches should be allowed from the outside holes to end of yoke. When a yoke is to be made for particular animals, a good rule is to stand them squarely together and so that their bellies are six inches apart. Then the distance from outside to outside of the necks is the distance between the outside holes; the inside holes to be at such a distance inside as to give free play to the neck without allowing it to twist under the yoke.

The bows are made by first working out strips of hickory or elm, to the proper size leaving a strip of bark on the outer edge; then steaming the wood thoroughly in a hot made for the purpose, and then bending, while hot, round a form cut for the purpose, in a block of wood, say the stump of a tree, and properly securing them there until set. We should never advise the farmer to make his own yokes or bows where it is possible to buy them, since they are far more perfectly made than can be done with the tools usually at hand to the farmer or village blacksmith. Both yokes and bows, are now easily procured at the agricultural stores in our large towns and cities. There are many places, however, where

yokes and bows cannot be procured, and in this case it is well to know how to make them. This can be done by any one handy with tools, having a pattern to work from.

It will not be out of place in conclusion to say that, in training steers, they must be taught to submit quietly to be yoked and unyoked. It may take some time and require some patience, and a judicious feeding as a reward, but the driver will be well satisfied in the end, when either steer will come at the word to be yoked or unharnessed. Another point is to make them work equally well on either side, and in this there is no trouble. A yoke of one-half or three-quarters bred Devons, that are well matched for activity, will do fully as much work at ploughing, dragging and other like work as any ordinary team of horses, and are worth fully as much money; nay, more, for when unfit for work they may be fattened for the butcher and will bring fully three-quarters of their original working value.—*Western Rural.*

The Granary.

Some place to store grain is a necessity on every farm, whether devoted to raising stock or grain. Those farmers who own only a small piece and raise just enough grain to supply the needs of the family, generally resort to an unoccupied room in the chamber of the house. This seems to us to be a bad practice, for unless the room has been built on purpose for that use, it is apt to draw a flood of rats and mice to the house. Then, who wants to carry all his grain up a flight of stairs as it is taken from the threshing floor, and down again when it is to be taken to mill?

Another class store their grain in bins built of rough boards, and very likely thrown up in a hurry in one corner of the barn. Rats and mice (and quite often hens) have free access to this at all times. They consume and carry off enough grain in a few years to pay for a well built granary. The place for a granary is, undoubtedly, in or near the barn where the grain is to be used. It should be rat-proof. And let us tell you how ours, which we claim has that quality, is constructed.

It is built in one end of a shop which stands near the barn. We selected the toughest white oak lumber we could find. It was one inch thick and six inches wide. This was taken to the mill and matched. (Did you ever see a rat hole through the joints of matched lumber? We never did.) Having a good floor of hard ash lumber and our studs set, we boarded it up on all sides with this lumber. But before we commenced this, we tacked a strip of tin about two inches wide to the floor next to the studs, letting it extend inward. When the first board had been firmly set upon this and fastened, the inner edge of the tin was turned up and nailed to it. No chance for rats there, said a neighbor who happened to be in while we were at work at it, and some ten years trial has proved that he was correct. The bins were partitioned off, the ceiling lathed and plastered, etc.—*Cor. Ohio Farmer.*

THE FOLLOWING is the latest obituary:

"Here lies interred Priscilla Bird,
Who sang on earth till sixty-two;
Now, up on high, above the sky,
No doubt she sings like sixty, too."

"If you wish to know whether it is going to storm or not, all you have to do is to find the storm vortex and see which side of it is the most moist. Multiply this by the square of the latent heat, subtract the time of day, and divide by the weathercock. The result will be the rarefaction, plus the thermometric evolution of the north pole, and then a wayfaring man, though a natural know nothing, can tell what will follow."

VALUE OF LEATHER SCRAPS.—Leather scraps are a very valuable fertilizer. The best way to utilize them that we have discovered is to bake them in an oven until they become quite brittle, and then to pound them with a wooden stamper or a flail upon a barn floor. In this way any waste leather may be made useful. They furnish an acceptable fertilizer for grape-vines, and may be hoed in around the roots. What will they cost?—*American Agriculturist.*

SOME of our readers who have lived fifty years may be glad to know what they have accomplished in that time. According to a French statistician, the average man has, at that age, slept 6,600 days, worked 6,500 days, walked 800 days, amused himself 4,000 days, spent 1,500 days in eating, and been sick 500 days. He has eaten 17,000 pounds of bread, 16,000 pounds of meat, and 4,600 pounds of vegetables, fish, etc., and drank 7,000 gallons of liquids. There are 18,250 days in a half century, and from the above statement it would seem that man slept just one-third of the time.

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