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The Field.

An English "Green Crop" Farm

The *London Agricultural Gazette* gives a very full account, from which we make some extracts, of the Maulden Farm, an area of 487 acres of light, sandy soil, in Bedfordshire, occupied by Mr. George Street. From the prominent place assigned to "green crops, as they are termed, the routine adopted on this farm well deserves careful study. The journal from which we quote, introduces its detail of Maulden Farm practice by remarking very justly,--

"On the successful cultivation of the green crop the status of the farm depends even more than on that of its wheat or barley, whether the interest of the landlord, of the tenant, or the laborer be considered. The permanent fertility of the land, the profit of the field, and the labor in which, according to the wise man, so much profit lies, all hinge more on the extent and excellence of the green crop than on any other single feature of the farm."

In this case, as will be seen from the subjoined quotations, kohl rabi was the chief green crop, and there were of it 70 or 80 acres of a clean and even plant, which will yield over 20 tons per acre. The farm was entered for a prize from the Royal Agricultural Society, and though not rated as the best, received a commendation from the committee.

The *Gazette* says At Maulden about one-fourth of the land is in permanent grass, and the remainder is cultivated mainly on the four-field course of cropping. It is a light and very easily worked soil, for which the past year has been as unfortunate and unfavorable as it has been fortunate and favorable for the clay land farms with which it has competed. The great wheat years of the country generally, 1868 and 1870, yielded here the minimum crops of Mr. Street's past lease, and 1871 and 1873, wet and inferior generally, here produced the maximum crops of his experience—his wheat average, 40 bushels per acre in 1871 and 36 in 1873, having averaged previously from 31 to 34 bushels over the whole wheat area, and being only 32 and 30 respectively in 1868 and 1870. The barley crop averaged only 32 and 29 bushels per acre in the two hot years, having been 40 bushels generally previously, and yielding 6 qr. per acre in 1872 and 1873. It is plain, therefore, that the Maulden Farm has not been able in 1874 fairly to justify and prove the real merit of its management. Official visits at seed time and July cannot in such seasons as the past ascertain the whole truth; and an inspection in the autumn, which this year witnesses the wonderful power of kohl rabi to cope with the difficulties of a drought, would always have the advantage of enabling judges to compare competing farms during two years instead of one, and in all probability of ascertaining how much in the case of each to put down to good management, and how much to good fortune.

The great average crops quoted above must be put down to good management in the case of Maulden, and not to the original fertility of the soil, which is naturally a poor sand and hot gravel. No doubt the question of agricultural merit is difficult to solve when it lies between the skill which by labor and good management makes a difficult but naturally well stored soil produce its utmost, and the enterprise and

confidence which make a poor but easy soil produce far beyond its utmost, and those who undertake the office of judge ought to have every opportunity that can be given them of guiding their decision. Here it is not by artificial manuring so much as by large consumption of purchased food that artificial fertility is best conferred. No artificial manure is so complete as that which is produced by the consumption of farm produce. It is when the storehouse of the soil is already pretty full that a phosphate or a nitrate will make the best return—the added ingredient then bringing into active use fertilizing matter which, without it, would have remained idle and useless. When the other ingredients of a complete plant food are not naturally present, the artificial addition of one or two is insufficient and remains without result. In the case of a poor sandy soil like that of Maulden Farm, it is therefore better policy to enrich the home-made dung by adding cattle food than by a heavy bill for superphosphate or ammonia salts or nitrates. Mr. Street has found this out, and while his annual manure bill does not exceed £50, paid to Messrs. Proctor & Ryland and others for their superphosphates for his green crops, the "artificial" food which he consumes, his cake bill, and the beans and peas of his own growth which he consumes, amount to at least £1000 per annum. The 2,000 loads of farm manure and earth which he annually applies are thus highly enriched, and applied almost wholly to the green crop quarter, they go to maintain the production of that cattle food on the after use of which the fertility of the farm is thus made almost wholly to depend.

Of the green crop quarter after wheat there are a few acres in rye and tares to be ploughed up in May and June for transplanted kohl rabi, and there a few acres in mangol wurzel every year for the latest spring keep before the rye and tares are ready. The kohl rabi, which is the main and almost only green crop is, however, generally sown pretty much as an early Swedo crop would be sown, at intervals, all through the month of May, two or three pounds of seed per acre being drilled in rows 22 inches apart, on land which has received a heavy dressing of well-made manure. The rye and tares, white clover, the pasture fields, with a certain extent of cabbages to eke them out in drought, the clover stubble, a few early turnips, the kohl rabi and the mangol wurzel, are the succession which keep cows and sheep, breeding and fattening stock, throughout the year. About two-thirds of the barley crop—Hallett's pedigree barley the sort adopted—are sown down with broad clover or with Dutch, and one-third of the barley stubble is ploughed up for winter beans or for peas. The whole of this is followed by wheat—Banham's browick red is the only kind sown—a portion of the quarter, whatever needs it most, receiving a half dressing of farm manure. After the wheat again come rye and tares. Tares are preferred, except when very dear, as catch crops, to be followed by kohl rabi, which being the rarity we once knew, for experimental use upon little more than garden scale, here usurps the office of providing the whole winter feed of the flock, and herd justifying the confidence thus placed in it, especially in a dry season such as the past, when Swedes and turnips have generally failed.

The work of the farm is done by six pairs of horses, and very handsome teams they are. The stock includes 16 cows with their produce kept on, and, with others purchased, making the annual sale of beef equal to about 30 fat cattle, at an average price of £25. About 700 sheep are kept, consisting of a flock of 250 ewes (280 this year) and their produce, and other sheep purchased for winter feeding.

The cull ewes are sold fat in their wool in November or December. The ewe tegs are kept for breeding, and the wether tegs (about 300) are clipped and sold early in the spring, weighing from 20 to 25 lbs. a quarter; some tegs that were clipped later last year made 75s. each.

Four or five sows are kept, and twice that number of litters, the greater part of which are fattened. This with a sale of about £150 worth of butter, £350 worth of wool, and one or two horses (as about three loads are bred upon an average), represents the produce of the live stock. To this we must add nearly 500 qrs. of barley, and 400 qrs. of wheat for the corn crop half of the farm—no mean yield of "food and clothing," altogether from less than 500 acres of naturally poor sand.

The land is clean—kept so by hand-forking of weedy patches in their first beginnings—but maintained so also by keeping the land constantly well covered with abundant and well cultivated crops. The laborers are a contented body. No less than £28 was taken by them this year in rewards for long service. They have good tools and good horses to help them, and this is literally true at harvest time when the work of cutting and tying and loading on to carts, and loading thence to ricks, is taken at an average price of 10s. to 12s. per acre—the reaping being done by machine, which, with horses, is let to them for 2s. 6d. an acre. The whole labor bill of the farm has been latterly increasing year by year, from £700 in 1871, up to £839 in 1873.

The farm is well equipped with satisfactory buildings—good homestead and good house—with good roads and fences—and with water power (steam power is only occasionally used), to the credit of both the landlord and the tenant. It is well equipped with agencies of all other kinds—laborers, live stock, manures, industry and skill—all of these to the credit of the tenant. It is in thorough good condition, whether that be indicated by the artificial maintenance of high fertility on a naturally poor soil, its freedom from weeds, or the selection of good and appropriate crops and the abundance of their produce. It is a good example of the power of capital and skill, when encouraged by a lease for a sufficient term of years to make poor land productive. It is doing its duty to the country as a large producer of meat and bread, and beer and butter, and wool all first class agricultural productions.

Early and Late Sowing of Fall Wheat

A Massachusetts Farmer writes very sensibly on the above subject in the *Vermont Farmer*. He says:—

"Those who favor sowing early claim that the plants obtain a firmer hold, tiller out more, and that the grain will be a heavier and larger berry. They claim that less seed is required, because much that is sown very late does not germinate at all, or else only sends up a single stalk, while that which is got into the ground early is surer to grow and more likely to throw up many stalks from a single root. Some who favor sowing in August or the 1st of September, say that winter grain will ripen at a certain time whether it is sown early or late, and consequently the earlier it is sown the more time it will have to grow, and the larger and nicer the crop will be.

Those who favor late sowing say that grain is not so liable to be smothered with snow late as it is, if it is got in early, that in lots where cattle are

allowed to feed that which is sown early is more likely to be injured by being pulled up, trod in, and eaten off, and that the berry will be as plump and the yield as good on fields that are sown late as on any other.

So much for the theories. I think in practice early sowing is to be preferred, although I have sometimes sown late with good results. The theory that grain will ripen at a certain time without regard to when it is sown is certainly incorrect. I sowed a piece to winter rye last fall near other fields which were got in early. Except the time of sowing, the conditions were equally favorable for all the fields, but mine were several days later than the others. As soon as ripe enough he cut it, ploughed narrow strips on which to stock it, and sowed these strips to rye. The remainder of the piece was sown much later. The result was that the early sown strips ripened a week or ten days before the rest of the piece, and they also produced a heavier crop of grain. But while the quantity was in favor of the early sowing, there was no appreciable difference in the quality.

While I prefer early sowing I should not hesitate to sow late, if for any reason I could not do it early. The quality of the seed and soil, and the way the latter is prepared, has more to do with making up the results than the time when the sowing is done. At least such is the lesson I have learned both from experience and observation."

Keeping Manure under Cover

A correspondent expresses doubt whether it is, after all, a good plan to keep manure under cover. He says that instead of rotting down, it becomes overheated and fire-fanged. Hence, he is inclined to stick to the old fashioned way, and let the dung take its chance in the barn-yard.

There can be no question as to the superior value of manure kept under cover, if it be properly prepared. Leaving it to chance, whether out-of-doors or in-doors, is a course no farmer should adopt. Everything about a farm needs looking after, and in proportion to the carefulness of the supervision and management will be the success. Dung left to take its chance out-of-doors, has the chief part of its virtue and strength washed away by rain and evaporated by sunshine. The same article neglected under cover will get dry and musty, or become, as our correspondent complains, overheated and fire-fanged.

A certain amount of moisture is necessary to secure fermentation and decay in manure. If this can be supplied in the form of liquid droppings from the stock that are kept, it will enrich the manure, giving it a higher concentrated value. If liquid manure cannot be added to the solid portion in sufficient quantity to secure the result, then water must be supplied.

Not moisture only, but air must be given to a manure-heap, whether it be exposed or covered. Occasionally forking it over secures a supply of air, and confers the additional benefit of thoroughly mixing up and composting the mass.

What is wanted above all else in relation to manure-saving and making, is such an appreciation of the value and importance of this branch of farming as will make people willing to bestow time and trouble upon it. That it pays to do this, all experience abundantly proves.

Antidote for Smut in Wheat.

A correspondent of the *United States Monthly Agricultural Report* says:

We have neither rust nor smut in any of our wheat fields. I beg leave respectfully to differ from the advice given on page 467 of the monthly report of the Department for November and December, 1871, wherein farmers are advised to "discard all idea of mixing ingredients with it (seed-wheat) to destroy smut." This question has been so well and thoroughly tested in our State as to be no longer even a matter of doubt. All our seed-wheat is soaked from eight to twelve hours in a solution of bluestone (sulphate of copper), in the proportion of six ounces to every 100 pounds of wheat. Smut being a fungoid growth, resulting from diseased grains, the germ or vitality of these diseased grains is killed by the solution of vitriol, and thus prevented from growing and contaminating the sound grains. A farmer here would be thought crazy were he to sow his wheat without subjecting it to the above process.

Results of Lime on Land.

After having used many thousands of bushels of air-slaked lime, and with over 30 years' observation, I shall state a few practical results and the conclusions arrived at. When at home, while a boy, I often helped haul out and apply lime as we were directed on ploughed ground. During those years I often wondered why a certain knoll on one of the home fields invariably produced better than elsewhere; and during this time, when ploughing that part of the old field, we would plough up coarse lime and many partly slaked stones. Asking my father what was the cause of this, he told me that when his father had built the house (a large stone building) that a great quantity of lime and the refuse of what was used was hauled out on that old knoll, now some 60 years ago, as it was then badly washed and unproductive, and barren, and that in time it began producing again. He supposed the lime had helped it and was then applying it as above stated.

My farm, when I went on to it, was in a badly run-down condition and from the past experience and observations, I burned and hauled out thereon from 50 bushels to 500 bushels of lime per acre, applying it variably on the surface at any season we could, for I had for years a large force of men helping burn and haul out, always spreading as we hauled and always commencing to haul as soon as burned, continuing until finished. Then we set to work on another knoll.

As to crops, the former occupant said they consisted of pennyroyal. 1. Character of the soil, the higher land limestone, 2. sandstone, clay and gravel; 3. limestone, 4. gravel and sandstone, 5. sand and gravel. This takes us through the various layers from the hilltops down the sides. It slopes every way as far as cleared, hence we will not trace it on to the base or hollows. We tried to grow some grain, but we never used the lime on the ploughed ground as many do; nor did we plough it under as some have done; neither have I ever seen a farm improved where they followed those methods. Results. grain and grass now grow luxuriantly, and where the most lime has been used the crops grow to a wonderful extent. These are plain practical results and not the theory of one who never tried it.—*Cor. Rural N. York.*

You may manure wheat too much, the growth favoring the straw rather than the berry. When used, however, as a top-dressing to start the crop, it answers an excellent purpose. Harrow the manure in when the seed is sown.

It is held that stirring the soil favors moisture, and hence is good in a drought. Crops have been nearly doubled in this way. But it is not the moisture alone that does this, it is the increased fertility as well, which the stirring of the soil favors—a double benefit.

WHEAT GROWING MAXIMS—Somebody has been at the trouble of condensing a great deal of information about wheat-growing in a very small compass, and somebody else has set it afloat without credit. If we could, we would gladly give the name of the author:—

The best soil for wheat is a rich clay loam.
Wheat likes a good, deep soft bed.
Clover turned under makes just such a bed.
The best seed is plump, heavy, oily and clean.
About two inches is the best depth for sowing the seed.

The drill puts in the seed better and cheaper than broadcasting.

From the middle of September to the last of October is the best time for sowing.

If drilled, one bushel of seed per acre, if broadcasted, two bushels.

One heavy rolling after sowing does much good.
For flour, cut when the grain begins to harden, for seed, not until it has hardened.

PRESERVING MANURE—The *Boston Journal of Chemistry* states that the sources of loss in the storage of manure are two first, the escape of volatile ammonia and other gases, and secondly, the loss of valuable salts by leaching. The first difficulty may be obviated by covering the excrement with eight or ten inches of good soil or loam, which will absorb all escaping gases. A bushel or so of plaster may be advantageously scattered over the heap before the soil is thrown on. The whole mass should be per-

fectly covered, leaving no "chimney" for gaseous exudation. The danger of leaching may be avoided by covering the heap with hay or straw sufficiently thick to shed most of the rain. If kept in this way a sufficient time the manure will undergo spontaneous decomposition, the products of which will be ready for immediate assimilation by plants. The usual process of carting manure to the fields in the autumn to waste, by both the above processes, some of their most valuable constituents should be avoided.

WHITE AND RED WHEAT.—It is said that the hard wheats are all natives of warm climates, such as Italy, Sicily and Barbary. The soft wheats are from northern climates, such as England, Russia, Belgium, Denmark and Sweden. There is, however, one exception to this general rule, as the celebrated Polish wheat is hard, and for this reason it has been contended that it was not a native of Poland, but was introduced here from some milder climate. The English atmosphere is so humid that it is impossible to ripen wheat hard, but in many cases it requires artificial heat to harden it before it can be ground into flour. Different soils and climates materially change the nature and variety of wheat. The difference between red and white wheat is not in variety, but is owing chiefly to the variety of soil on which it is grown. A generous dressing of wood ashes applied to the growing wheat in the former part of the growing season, will exert an excellent influence in rendering wheat of a lighter color than it would be without potash. Lime is excellent, also, for the same purpose.—*N. Y. Tribune.*

THE RAPE AND THE THISTLE.—The Berlin correspondent of *Land and Water* writes: "There are some curious matters I have to communicate to-day. Whoever knew of two plants being so inimical as to kill one another? This, however, seems to be the case when the rape grows near the thistle; and though I like the thistle, and have no antipathy against the rape, still I can be just, and, in acknowledgment of the rape being so useful whilst the thistle is merely romantic, I will make no secret of my tremendous knowledge. If a field is infested with thistles, which are very difficult to get rid of, give it a turn of rape-seed, and this machine-oily plant will's arve, chill, and suffocate the thistles out of existence. The case is this. A trial was made with different kinds of rape-seed in square plots. The ground was full of thistles, and it was thought that the rape-seed would not have a fair trial. But it had, and as it grew the thistles vanished, faded, grew grey, and died up as soon as the rape-leaves began to touch them. Other trials were then made in flower pots and garden beds, and always the thistle had to give in, and was altogether annihilated, whether the plants were old and fully developed or young and tender. No doubt this is owing to the greater impetuosity of the rape; but it is curious, as the thistle is so much deeper and stronger rooted, and its desiccation does not set in until it has been actually touched by the leaves of the rape. Electricity must be the secret. At all events, this plant and white mustard are the best remedies against thistles, when drilling and such-like things cannot be applied."

LIME FOR WHEAT.—One of my neighbors is trying an experiment with his wheat which I shall watch with some interest, and even now cannot help theorizing as to the probable result. The ground was manured for corn (first crop), produced two crops of corn, and is now drilled in with wheat. After ploughing the first time, air-slacked lime was spread and ploughed in, in about half of the field; over the remainder it was placed on the top and only harrowed in, no yard manure put in for wheat, but instead, a good coat of phosphate. Will he have a crop of wheat? If so, where does its nourishment come from? To my mind, lime is not a manure, but like cheese in the old couplet.—

"—The lazy elf,
Digesting all food but itself."

That is, lime compels other products of the soil to work by rendering them available as plant food, but furnishes no nourishment itself, hence the old saying—"Lime enriches the fathers but impoverishes the sons." That it will enrich the fathers no one doubts, but whether it impoverishes the sons, will depend altogether upon what use the fathers make of the increase, if they feed the products on the farm, and then return it to the soil, it cannot impoverish the sons. I prophesy a crop of straw and wheat for my neighbor at the expense of future crops of grain.—*Cor. Country Gentleman.*

Grasses and Forage Plants.

Uncertainty in the Seeding of Grass Lands.

There appears no settled rule in regard to the seeding of grass lands. Farmer A has sown in the spring and had excellent success, while farmer B failed of a stand; and so it is for all seasons of the year, failures and success lie along the pathway. To the practical farmer the success is plain, for then the conditions of moisture and warmth were favorable, and, on the other hand, unfavorable. In this part of the country, the best time for seeding is after the ground has been frozen and a light snow has fallen. The snow is useful as showing how the seed has been distributed, and the first thaw carries the seed to the moist earth, and it becomes imbedded into it, and, on the approach of warm weather, is sure to grow. In short, I have never known a failure when thus sown. For this purpose, the land should be prepared in the fall, harrowed and rolled. At all other seasons there is more or less of risk, as the season may not be so favorable. During a wet summer we may sow at any time, and I have known many instances of success in sowing on the stubble in July and August; but it is many years since such a venture would have been a success. Some argue that any time during the winter will do equally well; but such is not the fact, and the better time is early in the season, along with the first light falls of snow. As regards clover, the same rule holds good. We cannot always meet this requirement, for various reasons. Last spring I sowed clover as late as the 1st of May; but although I put in an extra amount of seed, the stand was not good. The seeding was a sort of necessity, as the land was so dry the preceding fall that it could not be put in order, and the spring's rains had to be waited for. The same condition is now present, and I wish to prepare a large amount of land for seeding; but that is out of the question, unless we have a good soaking rain to make ploughing possible. Some little of this can be prepared with the harrow and roller; but I fear that the story of last spring will have to be repeated, and the chances taken on a wet spring. No set of fixed rules can be adhered to, for things must be taken as they are; yet we must select the best time, and take advantage of it when possible to do so. It is this that makes the difference in results. Then, again, the proper time and good preparation make a difference in the quantity of seed sown, and this accounts for the difference in practice—one man sowing 6 quarts and another 16 to the acre; and both are right, and generally have about the same stand of plants. The one, depending on the better preparation and more proper time, requires less seed; and sometimes the use of a roller makes all of this difference. More than one-half of the grass and clover seed is thrown away on bad management. This is a great waste, and often useless, though we must not forget that occasionally we are compelled to sow out of the best season, and must take the risk. The weather is beyond our control, and all we can do is to so arrange our plans as to meet ordinary conditions.

Leveling Meadows.

The following suggestions by G. E. Blake, L.F.E., in the *Ohio Farmer*, are timely and useful:

Thousands of farmers in every State throughout the country find themselves annually perplexed and hindered in gathering the hay crop by the unevenness of their meadows, and perhaps annually make resolutions to put the mowing land into better condition after the harvest is over, but when the crop is garnered the resolution is forgotten until the mowing machine is brought out again, and then it is too late to apply the remedy, of course. The fall is the best time of the year for the work of leveling meadows, for the reason first, that at that time all of the products have been gathered for the season, and secondly, because where cutting and grading is done, the newly exposed soil has sufficient exposure to the atmosphere to put it into a condition of productiveness by spring, when it may be stocked down. Besides the above reasons, the soil is in better condition to handle in fall than in spring, and in most cases the farmer has more time to attend to the work.

Large knolls or mounds such as were caused by the upturning of trees, &c., should be ploughed and shoveled into a lower place or removed by the use of a road scraper to some hollow in the meadow which needs leveling up. To cut away ant heaps and prominences of that sort, a very good implement may be made by getting a stout iron knife blade long enough to reach from one runner of a sled to the other and

bolting the same, edge forward, on to the bottom of the runners. The knife should be let in just its own thickness, so that it will run along the surface. Make the knife sharp, and by drawing the sled over the field with the farm team all the bogs, ant heaps, &c., will be sliced off level with the earth. An old, worn-out wood shod sled may be put to good use in this way. If the sled is not heavy enough to do the work well, put on some boards or a waggon seat and let the driver ride.

Another very good implement is made by bolting a saw-mill plate to a stick of timber and hauling this over the surface. Obtain a stick of timber say six inches thick by fourteen or fifteen inches wide and as long as the saw plate to be used; frame into the center of the board side a crocheted pole for tongue, then bevil off the bottom edge of the timber so that it will set square upon the earth when the pole is elevated at the front end to the height of the neck-yoke, and bolt on the saw plate to front side, back down, so that the edge comes even with the lower surface of the timber, and the scraper is ready for operation.

Pasturing Winter Grain.

I once told a neighbor that hogs required salt. He acquiesced, and soon after emptied the refuse of a pork barrel in which were several pounds of salt into the pens. His hogs "hungry for salt," "went in," and some that got too much died. I was never forgiven; and to say now to that man that hogs need salt is to run some risk. So when I now say that winter grain may be safely and in some cases advantageously pastured, I do not wish farmers to turn all their stock upon their fields and blame me for their injudicious course. I merely say here what I have done and have seen done, advising those only to do likewise who are able to "lay this and that together" and act for themselves understandingly. When wheat or rye is growing thriftily, as it is now beneath the warm suns of the Indian summer and the moist nights which follow them, I have found it useful to turn a flock of sheep, but especially lambs, upon the field. These crop the plants about half their length, biting here and there a leaf, but do not pull up any of them. Their feet, with their light weight, press into the ground whatever plants they step upon, but they do not smother them. The soft, loose soil is pressed down about the roots wherever they tread, with great benefit. Every plant cropped is made to tiller and spread, the cropping being a sort of pruning, whereby lateral growth is encouraged. But no other animal should be turned upon fall grain. If the growth is too luxurious I would run all other risks but that of putting cows or calves to feed it down. Later, when the frost begins to heave the wheat, the trampling of a flock of sheep is of great service. Thousands of roots are replanted that would otherwise have perished. Some years ago, when in England, I saw a large flock of sheep driven into a wheat field, in the winter time, and made to travel back and forth in a compact body by a boy and dog. The strangeness of the proceeding struck me, but until I saw it often done afterwards in other parts of the country the same winter, I did not inquire the reason for it. When I did I found that it was to trample the wheat plants that had been thrown out by the previous night's frost back into the ground again. This was upon the light soil of the County of Norfolk. My own fields, upon which I have done the same thing, were of moderately strong gravelly loam. Whether this would answer upon heavy, sticky clay lands or not I cannot say, but some others may be able.—*Cor. N. Y. Tribune.*

Seeding Down with Turnips.

A correspondent of the *New England Farmer* writes: I have made it a practice now for some years of sowing flat turnips with my grass seed when I seed down in the fall, and with the best of results. I have now about two acres which were seeded in August, and, notwithstanding the severe dry weather, I have a good catch of grass, and the turnips are doing well. The broad leaves of the turnip protect the young grass from the scorching rays of the sun, without which protection the grass would have before this been entirely dried up; as it is, I shall save my grass and raise a few hundred bushels of turnips, and if as fortunate as I have generally been, next summer I shall cut about four tons of hay. On part of these two acres I had a crop of early potatoes, on the other a crop of oats before I seeded down. Last fall I raised about a thousand bushels of turnips in the same manner. The turnip has a long root which penetrates the soil to a great depth, and what nutriment it takes from the soil is obtained at a

depth to which the grass roots rarely penetrate, and through its broad leaves it obtains a large amount of its sustenance from the atmosphere. Hence, like clover, its tendency is to enrich rather than impoverish the soil.

Curing Hops.

An improvement in the method of curing hops has lately been introduced in England, by a Mr. J. M. Hopkins, a hop-grower near Worcester, which is said to be of great advantage to the grower, especially in seasons like the present when prices are so high from the light crop. The following is a description of this process:

"The hops being gathered, are brought to the kiln to be cured. There are three drying floors of rafters, covered with horse hair so that the heat and air can pass from below through each of them and out at the top, where an exhaust fan is kept in motion by steam supplied from a boiler in the basement floor of the kiln. The hops are first put into the top floor, where they remain about four hours, until the 'reek' is off them, when they are dropped (without handling) to the second, and finally to the lower floor, which is movable, being, in fact, composed of two large trays, which slide in and out of the building. The temperature of the kiln never exceeds 90°; the fan gives the advantage of drying the hops at a lower temperature than by the common process. Thus the aroma and volatile oil which would be driven away at a higher temperature are saved. The fan system has been tried with success in the drying of malt without deteriorating its quality. Under the usual system, the drying process in a malthouse occupies three or four days by the fan system it has been done in twenty-eight hours."

A new Disease in Clover in France.

A Paris correspondent of the *California Farmer* says:—Nearly all our cultivated plants seem doomed to pass through a series of maladies. In their wild state they are not so affected, at least we do not perceive such. Is it that culture, greater well-being in the conditions of their life, leaves them more exposed to the enemies, that the more we care for them the less they appear to depend on their own natural powers of resistance? The latest plant attacked with disease is clover; it sickens where it was formerly robust, or dies off in being cut at the crown, while the tap root remains healthy. The latter disease has been developed at the Grignon Agricultural College; the clover fades, blackens and dies, not in patches so much as by numerous isolated plants, and curiously most markedly on the soil where wheat and potatoes had previously been cultivated. It is at the neck of the plant, a little above the surface of the soil, that the malady appears, resembling in the marks as if it had been gnawed by a wire worm, but produced by a parasitic mushroom which as it grows alters the cells and their contents. When a dead plant is placed in a moist position for a day or a night it becomes covered with down—the same fungi that attacked it when living, and which is believed to be identical with that found on the leaves of a diseased potato plant.

CLOVER does well on a poor soil, if a good catch is secured and plaster used; but it does much better on a rich soil, paying well on the richest of land.

EFFECTS OF FODDER CORN UPON LAND.—It was held in the discussion, at the recent State Fair at Rochester, that corn in orchards was an advantage, owing to the cultivation which the land received; and it was further mentioned in the remarks elicited, that corn sown for fodder, in which case there were no ears to draw substance from the soil, improved rather than depleted the land, by the vegetable matter which the roots furnished the soil. This is on the principle that land improves by grazing. The grass is fed off without going to seed. The cases are parallel, as corn is a grass. It is encouraging to those who grow corn for fodder that this is so. Good crops can thus be realized for feeding green during the summer; or, if not all needed, saved for winter feed, the land remaining the same, or better fitted for other equally good or superior crops. Clover is still more beneficial to land. The two should be more grown, especially for the purpose of feeding in a drouth, or when the grass becomes rank and hard, and also as a feed during the hot days, particularly the hot noons, when cows should be put up or have access to shade, and then fed. Cows giving milk should be thus treated, as exposure to the hot sun begets fever, and the effect is communicated to the milk.—*Country Gentleman.*

Agricultural Implements.

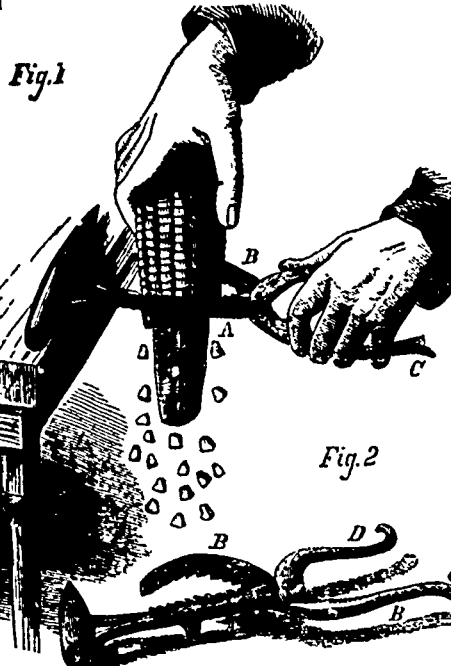
Wind Power for Farm Use.

An account has reached us recently of a new wind-mill which, if at all what is claimed for it, must meet with a ready sale, and be largely used for the purposes of agriculture—that is, for sawing wood, chopping grain, straw cutting, and the like—will, in fact, supplant portable steam engines which, however useful, cannot be set or kept in motion without fuel; and fuel in this country, especially in those parts of it which are cleared and settled enough to warrant the introduction of mechanical power, is a very important consideration as a question of expense. The usual form of the wind-mill, as most persons are aware, is vertical, and a great deal of trouble and expense is necessary in the construction; in fact, more than almost any common farmer would feel justified in expending upon it. That now proposed to be introduced is built on the horizontal principle, and its respective parts are so adjusted as to "take on" the utmost influence of the wind, and when that object has been attained, the sail is constructed to "feather itself" by an automatic arrangement until it arrives into position for receiving the impulse, at which instant it again presents a flat surface to the wind. Another consideration has also been attended to, viz., that when the wind shifts the automatic action may also be changed without difficulty and in a few seconds of time. The model which has come under our notice is constructed with sails 2 feet 10 inches long by 1 foot 6 inches wide, on an arm about 4 feet long. This gives an extreme width of 8 feet from end to end, and there are four sails. The upright shaft is about 2 feet long and 1 1/2 inches in thickness. The power evolved by such a comparatively tiny thing is astonishing. In a nice, brisk breeze, the revolution of the shaft could not be stopped by the hand however tightly grasped, and it may safely be calculated, we think, that an apparatus about half as large again would drive a small lathe or a straw or turnip cutter. Of course, for a general purpose farm mill the sails would require to be much larger, say 10 to 12 feet long and from 3 to 4 feet in width. Such a one should drive over a small threshing machine. Another feature of the horizontal mill is, that it need not be elevated more than 6 or 7 feet from the ground, whilst the vertical one must be raised as high again if not higher. In the former, too, the "wind shaft" is entirely done away with, the sails being on the upright shaft itself, and moreover the sails, in the event of a brisk wind, may be furled in a moment, or so adjusted for that matter, that the wind may strike against their edges instead of their flat surfaces. We will not, of course, vouch for the ultimate success of this new apparatus as a motive power on the farm. We will only say that the model promises well to all appearances, and should the requisite sized article only perform its duties as well, we have no doubt but the invention will prove as successful as useful, and meet with the demand which it will merit.

WOOD SAWING BY HOT WIRES.—A recent American invention is the sawing of wood by a white-hot wire. The process consists in substituting instead of the saw a platinum wire, heated white-hot by means of an electric current. The wire receives the same reciprocating motion which is commonly given to the saw, and thus burns its way through the wood. It is practicable, according to the inventor, not only to cut logs, planks or heavier forms of timber by this means, but also to give curvature to the cut and to produce fantastic forms of every description, since the saw, being without breadth, adapts itself to such purposes better even than the band or ribbon saws. Inasmuch as the wire burns its way instead of cutting, it leaves the surface of the wood charred; but this is an effect entirely superficial, and occasions no injury to the material.

A Combination Implement.

Wonders apparently will never cease, especially so long as our American cousins are permitted to live and move and exercise their ingenuity. Some time ago we took occasion to call attention to a swing-plough manufactured on the other side and imported into Canada, its main feature being a movable swing mould board adjustable on a swivel and designed for side hill ploughing. The novelty of the present moment, however, is a combination implement prepared more especially for shelling corn—a most tedious and uncomfortable job, all will admit, when accomplished by hand—but the implement or apparatus in question combines with its main use those of a boot-jack, a hammer, a hook-claw, a tack-drawer, a pot-lifter and a wrench, being thus seven-fold in its purposes. The following cut gives a very fair representation of it. As will be observed, it is constructed solely of three simple pieces of metal fastened together by one rivet.



The portion A is provided with a hammer at one end, a fulcrum or rest near the middle, and a curved stem, having teeth on one side. The part B is S shaped, and its upper curve is provided with teeth facing those on portion A. Its lower extremity, C, is formed for drawing out tacks or lifting off stove lids. The third section, D, is terminated with a hook which adapts it to various purposes. The position of the pivot is clearly indicated. Fig. 1 shows how the implement is used for shelling corn, the ear being introduced vertically between the toothed portions and the hammer edge placed upon the table. The shelling is accomplished by a downward motion and a quick turn of the wrist. When laid upon the floor, as in fig. 2, on the hammer end being pressed down by the foot of the operator, the leg or fulcrum raises the handles, which, together, form an excellent boot-jack.

Not content with all the applications of his device, as above noted, the inventor also suggests that a recess might be arranged in some portion so as to adapt it to cracking nuts.

Patents on combined implements of this kind, and simple household contrivances of easy manufacture, without involving large capital, are the class of inventions most in demand, and meet with ready sale.

The loss occasioned by carelessness in the handling and use of implements is one of the heaviest items of expense the farm has to bear.

Wheat-Threshing in California.

A subscriber sends us the following account, from a local paper, of the way in which threshing machines are run in California:

The thresher stood at one end of a narrow passageway, between two stacks of wheat. The engine stood at the other end, some distance from the stacks, and was connected with the thresher by a band. Ten pitchers tossed the wheat upon aprons on either side of the cylinder, before which the feeder stood, who crammed it into the capacious throat of the thresher as fast as his busy arms could work. The threshed and cleaned grain poured in a ceaseless stream from the machine on the other side. It was received by the sack tender, who has always two sacks ready. As one is filled, a moveable slide turns the grain to the other, he passes the first to the sack sewer just behind him. The sewer lifts the sack to settle the grain—perfected by practice, with a few deft and rapid motions, he sews and ties the corners of the sack. The whole operation requires about thirty seconds. The sack packer carries away the sacks, placing them in order so that they may be easily counted.

The work requires the following crew: one engineer, two feeders, ten pitchers, a sack tender, a sack sewer, a sack packer, a water hauler and a "straw buck," who removes and keeps the machine clear of straw, with the aid of a horse. In all eighteen men, and the owner, who is superintendent. The owner pays the two feeders and engineer \$3.50 per day each; the water hauler \$2 per day, the ten pitchers \$2 per day each, the sack sewer and packer each \$3 per day—the "straw buck" works for fun. The owner boards all hands and pays four cents a bushel for the wheat turned out. The full capacity of the machine is 1,500 sacks a day, the average work about 1,000, holding over two bushels each.

While we were present, a stack of wheat was finished, and it became necessary to remove to another part of the field. We, with others, timed the operations. The last sack was filled and sewed simultaneously with the last revolution of the cylinder. The band was slipped and in fifty-nine seconds both machine and engine, with crew following, were on the way to the other stack—the time employed in reaching the stack four minutes. The machine and thresher were re-set—every man was at his post—the band was attached, and the straw was crashing through it in just two minutes. The time from the filling of the last sack at the first position was just seven minutes, and the distance between was a little less than four hundred yards.—Country Gentleman.

PUTTING A STAPLE INTO STONE.—One often desires to put a staple into a block of stone. The hole is made, the staple inserted, and lead melted to run in. But unless the hole is made with the bottom larger than the top, the lead will in time work out, if there is much jar or side strain on the iron. Besides, the lead itself is liable to some compression, which admits of looseness, especially after being subjected to very hot fires. A much better article is sulphur. If this be melted and poured in around the staple instead of lead, it makes a much more durable job.

SOLDERING BROKEN FILES.—A writer in the *English Mechanic*, who had broken the only half-round file he had by him, says.—After trying to use the broken end (it was broken about the middle) I was about to give up in despair, when I thought I would try soldering; and, to my surprise, it not only stood while I completed the small job I was then doing, but is in use still, and will stand all the force such a file needs to have applied to it in ordinary use. I used ordinary solder, Baker's soldering fluid, and a Bunsen burner.

LATE FALL WORK.—The *Maine Farmer* makes these suggestions: Fall ploughing, not only of sward land, but of grain stubble and corn hill, may be advantageously performed now, and such pieces as are to be sown to wheat should be fully prepared this fall to receive the seed early another spring. The necessity of the complete fall preparation of land for wheat need not be fully set forth, as its advantages have been so well tested by many good farmers as to need no encouragement from us. In regard to land for other crops, it would be well if autumn preparation of the same were more fully practised. Especially would it be found useful on land generally wet in the spring, and upon which teams could not well move at a time when it should be worked to receive the crop. Manure may be also hauled out of the yards to better advantage now than in the spring, and if fences are to be changed or rebuilt, much of the work consequent upon it can be done better in fall, even if put off till quite late, than in the spring.

Horticulture.

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

THE ORCHARD.

Buying Trees.

The practice of dealing with every packman and agent that crosses our path, is one that is very certain sooner or later to end in discomfiture. Such has been the dearly purchased experience of thousands in the past, and still, notwithstanding all warnings to the contrary, will be the experience of thousands in the future. In trifling matters, the loss resulting from having anything to do with such questionable characters is proportionably small, but when such dealings involve the loss and worse than loss of thousands of dollars, the question assumes a much more serious aspect.

In no other branch of the agency business perhaps, is the public so systematically and unsparingly fleeced as in the purchase of fruit trees, and what renders the wrong all the more aggravated, is the fact that the discovery is not made for perhaps three or four years, the duped one all the time flattering himself with anticipations which it is of course quite impossible he can realize.

The best and surest way to purchase trees is to go directly to the nursery, or treat only with the properly accredited agents of first-class dealers. In the latter case see to it that the trees ordered come from the nursery which the agent is supposed to represent, as some parties are in the habit of using the order books of one firm while they fill the orders from perhaps half a dozen other nurseries. The advantages of dealing with the nurseryman direct are numerous, one of the most important being that a better and not unfrequently a cheaper selection of trees are obtained than can be expected through agents. Frequently also the purchaser is at a loss to know exactly the sorts he requires, in which case the advice of a practical man is particularly valuable.

Fungus on Fruit.

(To the Editor of the CANADA FARMER.)

SIR,—In the last number of the FARMER, I noticed an article headed "Fungus on Fruit," copied from the *Rural Home*, describing the injuries produced by a defect called fungus in certain apples; particularly Fameuse or Snow apple. Will you let me tell my experience with this fungus?

In 1829, (that's a long time ago), when I was an apprentice in a printing office in Kingston, I read in an American exchange, what the writer maintained was a positive protection against the ravages of the *lent caterpillar*, and also the *borer*. As the years rolled around, and I became possessed of a small orchard, (as many other printer's boys longed for), I did not forget the remedy. About twelve years ago the apples of a few of my trees were badly affected with the disease;—a pippin had never produced a sound apple; a Rhode Island greening had become worthless; two snows were sick even unto death; a Siberian crab ditto; and a healthy looking old seedling which had braved the storms of sixty winters was on the point of being sacrificed to the "woodman's axe." Recollecting what I had read, when a boy, and knowing no remedy, I thought I would try the virtues of the old recipe—sulphur. I took a three-quarter inch augur, and bored half through the trunk of each of the trees, about two feet from the ground, diagonally towards the earth. This hole I filled with sulphur, and covered the orifice with grafting wax. I did this in the latter part of February, just before the sap began to rise from the roots. To my surprise, each of these trees produced a fair crop of apples, *without a spec*, the first season afterwards; and they have never been troubled with the same disease since. Six years ago, finding that several other trees were getting tainted in the same manner, I adopted a similar course, with the exception that I inserted wooden plugs, instead of

using wax, and the results were the same. The wounds have all healed, and there has been no apparent injury to the trees. I found, however, that the sulphur did not interfere with the appetite of the *caterpillar*, nor did it loosen or dull the ceth of the *borer*: I however, easily conquer the caterpillars with a swab on the end of a long pole, while I dip into an old kettle of *pretty strong lye*—(I'm not afraid of strong lye; I wash my young trees with it every spring time), and wipe them off with very little trouble. Let me say, that after twenty years trial, I believe this is the easiest, least injurious, and most effectual remedy for this destructive insect. With regard to the *borer*, (another great enemy to fruit trees), the only way of destroying him, after washing the trees with lye or strong soap suds, is to be eternally vigilant in digging him out with a knife.

The *collin moth* so far has baffled me; but, as one of my neighbors has preserved all his apples this year by placing a bandage of wrapping paper around his trees, I shall try the same next spring. Now, whether or not the sulphur purified the sap in the trees, and thus prevented the formation of fungus, I leave to scientists to determine; all I know is, that after using it, the disease ceased.—Yours, &c.,
Prescott, Nov. 24, 1874. ST. LAWRENCE.

The Gravenstein Apple.

The Gravenstein is one of the best apples in the world, as all pomologists agree. The other day we met the man who set the first grafts of this variety of apple in America. Mr. Gorham Parsons, of the Fatherland Farm, Byfield, received from Europe a package of the grafts from the seedling tree. They were left at his counting-room in Boston, and he sent them to his country-place in Brighton, but his overseer, having no spare stock for them, sent them to Byfield. Our informant, Mr. H. D. Rogers, was grafting over the old trees at Byfield when the grafts arrived; but the foreman of the place, seeing that they were a little shrivelled, owing to their long voyage, and that they were rather small specimens of grafts at best, refused to have them set, declaring that he wouldn't pay for the work. Mr. Rogers, nothing daunted, carried the poor grafts to his father, a somewhat celebrated fruit raiser, and proposed to set them in his trees. But Rogers Senior didn't believe in new-fangled apples in general, nor in these withered grafts in particular, and he would have none of them. As a last resort, Rogers carried the cions to James Peabody, who favored everything new and fancy, and who gave him permission to set them, with the understanding that they would go halves on the profits.

The third year the trees came into bearing, and Mr. Peabody carried a plate of the apples to the cattle show, where they attracted much attention, though the committee could not name them. They were cut up into minute pieces and distributed among the connoisseurs, all of whom pronounced it the champion apple. The next year Mr. Peabody carried a plate to the fair of the Massachusetts Society, where he met Marshall P. Wilder, the President, who had just arrived from Europe with a basket of apples, a bunch of the grafts, and the name, which has always been spelled wrong, Graff Stein—Count Stone—being the name of the proprietor of the estate on which the apple originated. All the grafts in this country came from Mr. Peabody's tree, which took pity on the poor, imported cions, after they had been refused everywhere else.—*Newburyport Herald*.

How to Make a Croquet Lawn.

At the present day when a good croquet lawn is as necessary an appendage to a house in the country as a bowling-green was in the last century, the question is often asked, Which is the best way to turf it? The easiest and commonest one is to pare off the grass from a wayside waste or a common, or a sheep walk on the hills, and lay it down. Another is to clean the ground and sow it with grass seeds. A third is to use the turf that is found growing on the spot, where a piece of the park or a paddock is enclosed, or to take some from an adjoining pasture field. Now, where I have seen the first plan adopted—that of laying down turf from a common—there has been for the first following summer a very fair lawn; but, in the course of time, the seeds of plantains, dandelions, thistles, and other weeds have sprung up and stifled the grass. The second plan—that of laying down turf from a common—there has been for the first following summer a very fair lawn; but where the proprietor cannot wait for two or three years, but is desirous to play on it in a few months, this is not advisable. On the whole I am inclined, upon I

allow a very limited experience, to prefer the third plan, that of using the turf we find on the ground or in the immediate neighborhood. If this is pared off thin, the coarse, long-rooted plants, such as docks, cow-parsnips, thistles and dandelions will be cut off, and can be easily picked out and burnt, and their remains forked out in digging the ground and levelling it; while the real grasses and clovers will remain uninjured, and with rolling, mowing, and a liberal dressing of ashes, form an excellent croquet lawn by the next summer. I have known people go to a great expense to cart down turf from the top of a hill, and the money thrown away. The delicate air and festuca, as soon as they were transplanted to the richer mould below, have dwindled and disappeared; and plantains that were small and unnoticed before, have usurped their place, and covered the ground like a scab.

As croquet is becoming more and more a man's game, and is played with heavier mallets, a much larger lawn is now required for it than when it was regarded as merely a pastime for young ladies and children.—*Cor. Farmer (Eng)*.

THE GOVERNMENT of Victoria has forbidden the importation of vines. Wine-growing in that colony has become a valuable interest, and the Government will not incur the risk of introducing the phylloxera into the vineyards.

AMERICAN apples of the past season's growth are now selling at moderate rates in provincial towns, both in England and Ireland. The highly colored and well-flavored Baldwin is the commonest kind as yet. As usual, they come in barrels without any kind of packing material and come, as a rule, in excellent condition. That apples should be sent several thousand miles, and then be sold as cheaply as home-grown fruit, is a noteworthy fact. At this rate of progress, fruitless and cold regions will soon be supplied with the finest fruits at a cost that places them within the reach of all classes.

THINNING FRUIT BLOSSOMS.—Some of the older writers on fruit culture suggested that in the case of fruit trees that did not set their fruit well, it was of service to thin out the blossoms or to pick off the early petals of the flowers to ensure the remainder setting well. Mr. Du Breuil has been experimenting in this matter. In 1872, says *The Garden*, he operated upon twenty espalier pear trees of the Doyenne d'Hiiver pear, taking out the central blossom from each bunch of flowers on every alternate tree in the row. When the fruit was gathered he found that there was no perceptible difference either in the quantity, the quality, or size of the fruit. In 1873 he repeated the experiment upon twelve trees, operating upon an alternate six. In this case the trees operated upon produced sixty six fruits, and the six not operated upon produced sixty eight fruits. He therefore concludes that, whilst the theory appears rational enough, practice does not sanction its correctness; and that the operation has no influence upon the abundance of the product.

HOW TO GATHER CIDER APPLES.—This is the way the *Ohio Farmer* tells how: Get twenty-four yards of the best drilling, as it is the cheapest in the long run. Cut into eight equal pieces; these will each be nine feet long. Cut each piece obliquely from end to end, starting in four inches from one corner and coming out the same distance from the opposite corner on the other end. You will now have sixteen pieces, each thirty-two inches wide at one end and four inches wide at the other. Put the wide ends together, sow the strips together, hem the edges around the small hole in the centre, bind the outer edge well and fasten small stout cords at each of the sixteen corners. It is now ready for use. With these small cords tie it to the lower branches of an apple tree, wherever it is convenient. The tension you give in tying will determine the sag in the centre, so that you can accommodate it to the height of the lower branches from the ground. Drive the wagon under it, and shake all the branches immediately over the canvas. As the apples roll into the wagon, a boy can easily pick out stems and leaves. When one side of the tree is finished, the canvas is moved to another. In this way the apples are all in the wagon when the shaking is done, except a few that drop outside the canvas. If preferred, the apples can be delivered in a basket and then emptied into the wagon. Such a device saves half the labor of gathering apples, and if well made, of good material, will last for years.

THE FRUIT GARDEN.

Ripening Pears off the Trees.

The following valuable and timely article on this subject is from *The Garden*.—

It is difficult to make some persons believe that, as a general rule, pears should not be permitted to ripen on the tree. Of course, sticklers "for nature as a guide," will try to argue the question whenever it is presented in this form, but the proof is to be found in the difference in pears ripened by the natural and unnatural processes, if we choose to class them as such. Winter pears and apples do ripen finely after they are taken from the trees, but I hardly think it will be claimed that these same varieties would be of better quality if grown where the season was sufficiently extended to admit of full maturity upon the trees. Our northern varieties of these fruits when cultivated in a southern climate, do not show any improvement in consequence of the change; and further, the pomologists of the south, as well as those of the north, advocate house-ripening of pears and late apples. There are, it is true, a few varieties of our best pears which appear to retain their good quality as if allowed to mature on the tree, but these are exceptions to the general rule. But this is not conclusive evidence that they would not be better if gathered before perfectly ripe. Of course this early gathering of pears is nothing new to experienced pomologists, but the masses do not appear to know anything about it, hence their neglect of this very important part of pear culture, and the consequent failure to secure excellent fruit. I am reminded of this by seeing early pears in my neighbors' gardens and orchards, as well as wherever I happen to travel through the country, all lit upon the trees until they fall with over-ripeness. It is no wonder that we hear complaints of rotting at the core with such noble varieties as Flemish Beauty and Clapp's Favorite. The first, in particular, will show a splendid exterior up to the last moment if left on the tree to ripen, while from the centre out to within an eighth of an inch of the rosy cheek is a mass of rotteness. Out of more than a thousand varieties of pears grown by Moore's *Harb' New York*, we did not find one which was not better in quality when ripened off the trees than on it. The chemical changes which take place in the fruit during what is termed ripening appear to be more perfect if retarded than when hastened, hence the benefits of gathering early and placing where the process will proceed slowly. We have many varieties which, if allowed to ripen on the tree, have a coarse gritty flesh, but become mellowed and softened, or, as the pomologist would say, "buttery," when ripened in the house.

When to Gather Pears.

It would be difficult to designate the exact time when any particular variety should be gathered, for it is the conditions which must govern in these matters, and they vary with the seasons even in the same locality. A little observation and experience will usually enable one to come near enough to be successful. When a few of the earliest matured on a tree begin to change color or drop off, and the stems of those which are still green will part readily from the branch when lifted, it is time to gather all. Perhaps there is no surer method of determining maturity than the free parting of the fruit stem from the spur on which it grew. If the stem adheres so firmly that it will break, then the fruit is not sufficiently mature for gathering.

Preserving and Ripening

In gathering, considerable care is required to prevent bruising, because pears will not withstand as rough handling as apples, for a bruise is usually followed by rapid decay. Every specimen should be picked by hand and laid into baskets, not dropped, as though they were cobble stones or potatoes. When gathered, place in a cool room or cellar in baskets, boxes, or barrels, allowing free ventilation for two or three days; then pack in tight vessels, but not larger than barrels, leaving the heads open or merely laid on loosely for a week or two longer if the variety is a late one, and it is desirable to keep them as long as possible, remembering that slow ripening will bring out more fully the good qualities than rapid, consequently a very cool place is preferable to a warm one. If spread upon shelves in a light airy room or cellar, shrivelling and decay will soon destroy the best and longest-keeping sorts. I have found tight boxes, like the common cheese box or half-barrels, with light fitting covers, very handy and excellent for keeping early or late

varieties. For winter sorts, like the Vicar of Winkfield, Laurence, and Duchesse, it is an excellent plan to wrap each specimen in tissue paper when packed away for one's own use. By an occasional examination of the top layer the condition may readily be determined, and when ripening is desired or delay is no longer safe, the specimens, or those wanted for immediate use, should be taken into a warm room—for instance, the kitchen closet—but still kept in a tight drawer or box. A week in such a position will increase the sugar in almost any variety, perhaps, fifty per cent. I know that some of our pomologists would smile at the idea of the Vicar of Winkfield pear being a good dessert variety; but if they will start with well-grown specimens in the fall, keep them in a cool place until January, or even later, then ripen them up in a warm room slowly, they might find occasion to change their minds in regard to quality. But if ripened hastily it is poor enough and valuable only for cooking, and the same may be said of many other popular sorts. From long experience I have learned that to obtain a good crop of pears is but half the battle; they often require careful manipulation in order to get the most satisfaction out of them, and equally as much skill as in the produce tion.

A Year's Grape Experience

The *German Town Telegraph*, under this head discusses the botanical and entomological phases of grape culture thus:

When the entomologists announced that they had discovered the truth of the grape trouble, and that it was an insect feeding on the root, a new party at once arose, which was quite sure that the phylloxera had very little, if anything, to do with it. It was mildew and mould and not an insect—a botanical, not an entomological study. It is not to be wondered at that these radical differences should exist. There can be no doubt in the world but that those who have studied fungoid diseases of plants, and have advocated the fungoid origin of grape disorders, have proved their point by irrefragable evidence. It is equally true of the root-insect idea. Here are the insects, there are the rotten roots in myriads as the consequence, and every child knows a vine cannot do well when half its roots are destroyed. What is the simple editor to do—who has no theory to advocate, but whose business it is to direct the judgment of the reader according to all the facts in hand. He can only say that no one thing causes disease, at least there are many things which will cause disease, sometimes perhaps existing together, so that one depends upon the other, at other times each acting independently, and as some of our friends expressively say, on its own hook.

But independently of fungus and root-parasites, it seems clear that the little secret conditions of season—the exact elements of which no fellow has yet found out—have their own distinct field of labor. Look at the old varieties which have almost gone out of some good catalogues, and which many have thought "gone up," and see how well they have done this season. The antiquated Catawba, which at one time stood at the head of the grape lists, and then fell to the foot, has this season almost equaled its best days, in the few old foggy gardens where an attachment to the good things of the past permitted a few plants to survive. Looking at these facts we say at once that season has to do with success, and perhaps feel some contempt for all other suggestions.

It has been of late years pretty well understood that an old-fashioned dry time, is good for the grape, and we have had it dry enough in all conscience this season. But how was it in the past? The Catawba at one time did as well as the Concord does now. We suppose there were wet seasons and dry seasons. Probably they were wetter than now, for the scientists are telling us that the cutting away of forests increases the dry times. Yet the Catawba did well in all the rain and drizzle of these pre-generative days. There must be some cause besides mere climate. Yet it is strange to the mere looker-on that beyond the mere fact that the Catawba grape has done remarkably well this season, so little more should be positively known.

LIQUID MANURE IN THE GREEN HOUSE. Manure is best applied to plants in pots in a liquid form. That obtained from sheep droppings or from cow dung (with a little soot added if it can be had) is preferable to that obtained from chicken or pig manure, guano or even horse droppings; as it is less stimulating and does not cause such an excessive leaf and stem growth, or produce as serious injury if incautiously applied.—*American Garden*.

Strawberry Culture in Scotland.

A correspondent of the *English Journal of Horticulture* writing from near Ferdel Dea, a place celebrated in Scotland for growing strawberries and other small fruits, says:

The late Mr. Moffat, whose name is celebrated in Edinburgh for Ferdel Dea strawberries, told me he grew them for 14 years without renewing them, and then he rested the land one year, manured it, and planted on the same land. But it is a deep heavy soil, and such the strawberry delights in, while on land the reverse, the plants will die out yearly. I have been acquainted with strawberries for 47 years, and the best I ever saw was at Glamis Castle, Forfar, this year. The sorts were Eclipso and Elton. Keen's seedling was about past. At Lester, Haddingtonshire, the seat of the Marquis of Tweeddale, they were equally good, the soil in both places is very strong and deep, and a little cold. About 1½ lbs. would be gathered off one plant, but the plants were nearly two feet between each other, and nearly three feet between the rows. It was a treat to see the berries hanging round the plants. Within four miles of this, there are two hundred acres of strawberries grown, but at Ormiston three to four crops only are got when the plants must be cleared off. The soil is lightish with a gravelly subsoil. The fruit is sent to Edinburgh, Glasgow, Dundee and Aberdeen, often in barrels, but for the Edinburgh market, it is sent in small round baskets, which hold 1½ lbs., and sell from 6d. to 1s. each. At 6d. they give a good return if the crop is good. When planted in April, the fruit is by far the largest the following year, but the crop will not be over half of what it will the second year.

The Gardens of the Hesperides.

In this age of general research, every day, so to speak, is bringing to light facts which go far to prove that all the legends and fables of the ancient world had their origin in solid realities, and that all the gilding of poets, and all the wild superstitions of historians have not rendered these realities unrecognisable, when modern research has signalled their discovery. The beautiful legend concerning the three daughters of the evening star Hespera, who dwell in a lovely hidden garden near the northern coast of Africa, in which the melodious accent of their songs was heard, though the singers were never seen, on account of the lofty wall of rocks piled by the gods, which surrounded the garden, is founded on very simple facts, as regards the garden itself. Even the golden fruits, and the dragon Ladon who, issuing from his dark cave, guarded its entrance, have their foundation in fact—the embellishments of the poetic legend, regarding both golden fruit and dragon, being faithful picturings, very little more highly colored than those of modern poets. The lovely garden valley, watered by many streams, and near which the great city of Berenice arose afterwards under the Egyptian rule of the Ptolemies, still exists in all its primeval beauty. The fabulous rock-piled walls are, the great mountain cleft, in which lies, softly sheltered, a deeply depressed winding valley, full of the richest vegetation at all seasons, its golden fruits being those of Orange and Lemon trees, which bear both flowers and fruit all the year round. The dragon, is neither more nor less than the tortuously winding stream, issuing from a cave, which crosses the entrance of the valley, and seems to prevent all access to its picturesque recesses. Now, that more than usual attention has been called to the real existence of the garden of the Hesperides, in consequence of the village of Bengazi, which occupies the site of the ancient Berenice, having been signalled as one of the secret seats of the slave dealers (whose proceedings are about to be suppressed), we shall, doubtless, have the ever enterprising Mr. Cook conducting his Egyptian tourists to the spot, by a small detour, at so much a head, and the gardens of "The Hesperides" will go down in his list of stations for so many hours, or days, halt, as may be found convenient; all for a very moderate extra charge of so many piastres.—*The Garden*.

Mr. B. MOTLON, of Muskegon, Mich., has a peach orchard of fifteen acres, from which he harvested this year 4,000 baskets, and a vineyard of eleven acres, from which he has gathered 8,000 baskets of grapes. It is but a few years since the land was reclaimed from the forest.

THE VEGETABLE GARDEN.

A Paris Market Gardener on Sewage Manure.

Every time that we visited the ground of the sewage garden at Clichy we were struck with the difference between the crops there, and similar crops in market gardens. The vegetables appeared to be only half the size of ours. It was the same in the case of field crops, and especially with the beet-root and maize. The season was moist, and, from the nature of the experiment, the manure was moist; we did not, therefore, form any opinion with respect to the value of the sewage. In 1868 the engineer-cultivators of Clichy were favored by an exceptional summer. In that year they could compete with the best market-gardens in pumpkins and cardoons. But is there anything surprising in that? What these plants require is plenty of sunshine above, and plenty of water at their roots. Their salads, although apparently flourishing when young, had almost all damped off when gathering time came. The cabbages were only a very moderate crop. The leeks and carrots the same. The tomatoes were a short crop; the fruit was tolerably good, but ripened very late. The melons planted out perished to the extent of three-fourths, and the remaining fourth was only saved by the exceptional heat of the summer. The white celery was satisfactory, but the celeriac was not. There was a very fine field crop of maize; but the year was unusually favorable for this crop. The beetroot was very inferior to that grown in the plain. The potatoes were for the most part lost, but then it was a bad season for them nearly everywhere else. The badly-formed and strange-looking tubers, and numerous deformities of growth proved that the mode of culture employed had been unfavorable to them. The following are some of the most important of our observations:—On a space of 42½ square feet, we counted twenty tufts of French beans—in a market-garden there would be forty to forty-five tufts in the same area. On a similar area were eighteen plants of celeriac—in a market-garden there would be forty-eight plants, double the size. On a similar area were twenty plants of white celery—in a market-garden there would be fifty-six plants, certainly finer. On a similar area twenty-four plants of endive—in a market-garden there would be forty-eight. On a similar area eight heads of cabbage—in a market-garden there would be thirty-six; and so on with all the other crops. The half of the ground is lost in the channels. It is impossible to make sowings and interplantings among the plants grown in this way, and yet the produce is only very indifferent in size and development. It is only at the distance of 15 or 20 leagues from Paris that these sewage crops could compete with those of the market-gardeners at Amiens. As for the Parisian market-gardeners, these experiments have taught them nothing worth knowing, unless it be the fact that they are still the most advanced men in their business, and that in this so much extolled sewage manure they will find nothing worth adopting. The field crops at Clichy did not offer a more encouraging prospect; on an area of 94 square feet we reckoned eighteen plants of maize where there should have been double the number. On a similar area we counted twenty-one very middling plants of beet-root. In the plain this space would be occupied by, at least sixty-three, and at the most eighty-one plants, with finer roots and of better quality. All the other crops there called for similar remarks. Supposing for a moment that the plants grew as well at Clichy as they do with the market-gardeners, would the latter be able to draw any profits from their land, rented at from £24 to £30 an acre, if they grow their plants with such spaces between them? Assuredly not. Since the engineers have done so badly in an exceptionally good soil and an unusually fine season, the market-gardeners will, for a long time to come, stick to their good horse-manure.—*The Garden.*

Drainage.

About three-fourths of the complaints that reach us of the misbehaviour of fruit-trees, and the failure of vegetable crops, and the unsatisfactory blooming of roses and many other things, have one common origin—the want of drainage. We see people laboring away at the surface, raising the level by additions of soil, manuring liberally, removing plants that have not prospered, and planting others in hope of better luck; and we can tell them, when all is done, that until they secure the first essential of success—a rapid removal of surplus water—there can be no success to their efforts, manure and plant as they may. At this time of year you have but to open a hole one spade deep, and in less than ten minutes that hole

will be filled with water, which proves that the whole surface soil is saturated, and that any cavity, tunnel, or opening would immediately draw off the surplus water, according to the capacity of the opening, and that therefore very simple and inexpensive means would suffice to enable the soil to get rid of the water which is in excess of its power of absorption. A two or three inch pipe, laid at a regular fall at about three feet beneath the surface, will effectually drain a breadth of from 20 to 100 feet in width, according to the nature of the soil and its relative level. Generally speaking, the drains should be three feet deep and twenty-four feet apart; but in a wet clay they will not be too close at twelve feet apart. In districts where there is any apprehension of the disturbance of the drains by moles, one-inch pipe should be used. On very flat land a fall of one in fifty will suffice to keep the water moving; but a rapid fall is preferable if the outlet is low enough to admit of it, as in times of sudden heavy rainfall a quick removal is very desirable. Of course we cannot here enter into the details of the subject; but as this is a good time to drain land that requires it, we again remind our readers that good drainage promotes the warmth and fertility of the soil; and, on the other hand, a water-logged soil is almost poisonous to every kind of plants that come under the care of gardeners.—*Gardener's Magazine.*

SPINAGE.—In the spring, when anything green is something of a luxury, few things come more acceptable to most tastes than a dish of spinage. It is a vegetable that requires for its best development a rich soil; as rich indeed as is asked for by any garden crop. The seeds may be sown either broadcast or in rows about fifteen inches apart. Some growers sow radishes among the spinage plants in early spring, but this is only where the ground is very rich, so as to force on the radishes fast, and get them large enough to be drawn off and sold before the spinage has grown much in their way.

THE FLOWER GARDEN.

My Flower Bed.

A lady correspondent of the *Fruit Recorder* gives that paper her experiences of flower culture under difficulties in the following words:

I determined to have a flower bed, but I thought I had scant materials for making it. I, a woman, with two almost babies to care for and housekeeping to attend to, seemed a very unlikely person to make flower beds, with no very available materials, but I went to work. First, by dint of perseverance I gathered together a pile of stones from various places on the premises, and with them described a circle on the tough clover sod, about six feet in diameter. The sod was not cut up within the circle but was left for drainage. Then with an old wheelbarrow I hauled three or four loads of lime from an old mortar bed and dumped down within the circle of stones. Then I brought two loads of sand that had been thrown to the surface when the well was dug. There was no manure available but fresh horse manure, but of this I brought three loads, and then mixed thoroughly the sand, lime and manure with enough surface earth from our new garden to make the pile high enough for a flower bed. Then I made another circle of stones, three feet in diameter, on top of the pile, and filled this with manure, earth, &c.

We had chickens; from their domicile I obtained enough hen manure to cover thinly the pile of dirt. This all happened in the spring. I let matters rest now till September; when I sent to one of our prominent seedsmen for mixed tulips at 50c. per dozen. I sent for single early parrots, double and late show tulips. When I set them out I put a handful of pulverized charcoal (from the kitchen stove) around each bulb. The next spring I had the most beautiful array of tulips I had ever seen. If tulips are hoed every day (like onions) they will be wonders of beauty; try it. As soon as done blooming I plucked off the seed pods so that the whole strength of the plant would go to the bulb for the next season's blooming. When in bloom I had taken clap boards split to the width of two inches and driven them into the ground around the bed 18 inches apart, and twined other split boards among them. I thus formed a fence two feet high that was useful in keeping out chickens, dogs and mischievous babies. This I did not consider ornamental at the time. I now had an opportunity of procuring leaf mould from the woods; this I spread over the bed two inches deep and I hope to see the good effects of it next spring. But I wanted flowers through the summer, and I hope scientific florists will not turn

up their noses when I say that I planted petunias and morning glories in my tulip bed. These don't need to be sown in a hot bed, and transplanted with great care, but can be sown just where they are to grow and will renew themselves each year if you do not feel disposed to gather the seed. An arch formed of old barrel hoops makes a very good handle to our large flower basket; for such it seems to the beholder. The effect is truly pleasing in the morning, to see the wealth of morning glories—purple, blue and pink overflowing the basket on all sides, creeping in the grass and twining around the handle with petunias peeping between. This is a simple flower bed and does not take much time or money; but everybody that sees it admires it. And now I have told you how I made something out of almost nothing.

Edgings for Garden Walks.

It is generally desirable that we should endeavor to preserve the shape of our flower beds and borders from year to year, so that the plants shall not interfere with the walks. Where flower beds are cut out in the turf on the lawn, an edging with the spade is all that is necessary to keep them in shape for all time. It has been the custom for years to use a dwarf-growing box for edgings; still this is used only by a few, and as it does not flower, there are many who would prefer to use flowering plants for this purpose.

The double-flowering sweet violet is a capital plant for edging to beds, borders and walks. The best time to plant them is in the spring, when the beds are spaded up and got into shape for the season. Draw a line where it is desirable to form the edging, and after separating the plants into small pieces, plant them firmly about six inches apart, along after the line. In a short time they will present an unbroken line or edge, and the next season they will give an abundance of their acceptable fragrant flowers. The double Russian is the variety best adapted for this purpose. The annuals and other flowering plants can be planted quite close to the violets, as some shade will be found to be beneficial to them.

The double daisy makes one of the best of floral edgings, and should be planted quite thickly for fine effect. We have seen edgings of this pretty and popular flower that were vastly superior to anything else in the line of edgings.

The *Sedums Sibboldi* and *Variegatum* are excellent, used for this purpose, being both perfectly hardy, besides standing perfectly well through the hottest summers, becoming denser each succeeding year, as well as being loaded with rosy purple flowers in the autumn.

The dwarf, fine-growing varieties of *Sempervivum* (Live-for-ever), may be used with capital effect and results, and will please all who try them for this purpose. For edgings to walks and beds in the kitchen garden, there is nothing to equal or compare with the double-curl parsley; and as this can be procured cheaply and with so little trouble, as well as being of service in the kitchen, we advise all who care for trimness and neatness in their garden walks to give it a trial.—*B. B. in the Farmer.*

NEW ORCHID.—One of the most striking and elegant orchids we have lately seen, and one quite new to us, is *phajus bicolor*. It has the habit of *P. Wallichii*, but the flowers are smaller, more elegant in form, the sepals and petals lanceolate, brownish, the lip pinkish. We saw it lately in bloom at the Jardin des Plantes, and were much struck with its beauty.—*Gardener's Chronicle*

ON THE COLORING POWER OF WATER.—It is a curious fact—and I am not aware that it has been noticed by scientists—that pure water develops the coloring of such leaves as alternantheras, golden and silver tricolor pelargoniums, iresnes, crotons, &c. Drought takes the color out, water either puts or keeps it in. There is no doubt about the fact; as I have seen thousands of alternantheras almost colorless during the past season of drought, and others that have been soaked with water once or twice a week beautifully colored. Frequent overhead waterings is also the surest method of fixing the color in, and bringing more color out, of golden tricolor pelargoniums. Under glass water is equally effective in keeping such leaves in full color. Iresnes and amarantuses become dingy during growth, and color up anew after rains or artificial waterings. And even the greenness of grass and of the foliage of trees is largely dependent on the amount of moisture that falls upon them. Many roses again, especially pinks and reds, are so much finer and more delicate in color after heavy rains or artificial waterings; Marie Beaumaris for instance, is a sight to see after a heavy rain.—*D. T. F. in The Garden.*

The Dairy.

Rich Cheese from Skimmed Milk.

The New "Departure" in Dairying.

No movement in dairying is now being more widely talked about, and none perhaps is so little understood, as the new method of imparting a rich body to a skimmed milk cheese, as practised by the American Dairy and Commercial Company. As the question has attained such a public character, and many fabulous reports are in circulation concerning it, the *Utica Herald* resolved to investigate and furnish its readers with a straightforward, trustworthy account of what the new process is, the theory it rests upon, the practices now in operation, and the men who have the management of the business. "With this end in view," says the *Herald*, "we visited McLean, in Tompkins county, where the American Dairy and Commercial Company have had their headquarters since last spring, and where, during the summer they have been manufacturing milk according to their novel method. Our visit was made on Friday, October 29, and we were furnished with every opportunity by the officers of the company for making our investigation thorough and satisfactory. The results of this investigation will appear under the proper headings as we proceed.

The Theory.

The theory of the new process of cheese-making, for which the American Dairy and Commercial Company hold letters patent, is that skim milk cheese, a food material of little value, may be so improved by the addition of wholesome foreign enriching material, that its value for food and as a commercial commodity may be greatly increased. Second, that this being established, the cream may be taken from the milk, profitably manufactured into first-class butter, and the skimmed material may then be increased in value and nutritive qualities by substituting, in the place of the cream removed, a pure and wholesome but cheaper oil. The aim is to make first-class cheese and first-class butter from the same milk, and to gain the profit which must accrue from such an operation if successfully accomplished.

As this is a question which will call forth much comment and discussion among the dairymen, we have made a careful effort to learn the character and standing of the men who have the new processes in charge. At McLean, where the work has been going on during the summer, the dairymen with whom we conversed speak in the highest terms of the company. It was the unanimous remark of the dairymen that they never had gained so much money for their milk as this year. A. B. Lamont, a vice-president of the American Dairymen's Association, whom we met at McLean, made a statement to us to this effect. The president and manager of the company's business is Captain Henry D. Gardner, formerly of North Marshfield, Massachusetts. He is a gentleman of character, means and worth, of whom every one we saw spoke words of praise and confidence. The inventor of the process and agent for the company is Henry O. Freeman, of Sherburne, Chenango county, and to his original idea and careful experiments upon it, the system owes its present success. The company has abundant resources at command, and does not hesitate at expenditure which seems necessary to give its method full practical tests.

The Practice.

We reached the McLean factory on Thursday morning, after the coolers had been skimmed and the skimmed milk placed in vats. The factory is a large structure, 326 by 32 feet, two storeys, with a pool room in a wing adjoining the make room. The outside is tastefully painted, the windows protected with Venetian blinds, and everything about the establishment is wholesome, sweet and commendable. Of course, the interest in our visit centred in the vats, and to these we gave special attention. While the skimmed milk was heating up in the vat, the maker, George Vandegriff and his assistant, E. N. Robinson, were engaged in the engine room preparing the oil which was to be added to the skimmed milk when the proper temperature should be reached. We examined this oil with care. It is oleo-margarine. It is odorless, and to the taste presents a pure oily flavor. A new barrel was opened in our presence. It is a white opaque mass, fine grained, and apparently pure and unadulterated. The company procures this fat from one manufacturing house in Brooklyn, where they are confident of being furnished nothing but the best material. In preparation for introduction to the

milk, the fat is heated slowly in a water bath, in deep pails (coolers), until it is melted and raised a few degrees higher in temperature than the milk into which it is introduced. In this state it is of a clear, golden color, and clear as crystal.

By this time the milk in the vat, which had been skimmed at 24 and 36 hours, was raised to 92° of temperature, and the process was begun. A light wooden frame, like that which is commonly used to carry the cloth strainer, was placed over the centre of the vat, and a tin vessel about eighteen inches square, with a finely punctured bottom, was placed upon the frame. The annatto had been previously stirred into the skim milk. When the square strainer was in position, the melted oleo-margarine was poured through it, and it spread itself over the top of the milk in a bright golden flood. The vat was quickly stirred, and then the rennet was added. The quantity was large, for coagulation is expected in eight or ten minutes. From the time the rennet was added until coagulation occurred, the milk was constantly stirred by two men. They passed up and down, one on each side of the vat, and drew over the surface a wooden agitator shaped like a hoe with a large blade. This was done for a few minutes, the men passing each other at the centre of the vat, working in opposite directions. Then they worked together from one end of the vat to the other, and returned abreast. This constant surface agitation was of course intended to overcome the rising disposition of the oil, and to force it down into the milk, where it could be taken up and held by the quickly forming curd. This stirring continued for eight minutes. As soon as the stirring ceased the milk was found to be thickened, and soon took on the form of a fixed curd. In about twenty minutes from the time of the introduction of the rennet, the maker began to cut the curd. He worked lengthwise and crosswise with the perpendicular knife, and then lengthwise with the horizontal. After the cutting the surface of the vat was covered with a heavy coat of oil, and the curd settled from view. In five minutes more the curd was worked over hastily by hand. It was coarsely cut, the pieces being as large as good sized dice. The stirring brought up the oil in a thicker coat, and the surface looked almost as golden as at the beginning. But taking up some of the curd and breaking the pieces open it was easy to see the fine globules of oil intimately mixed in the fibre of the curd, showing that the skimmed milk had taken up the oil and that the rennet had fastened upon the larger globules and held them prisoners.

Since returning to the city we have examined some curd which was forty-eight hours old, with a microscope. The difference in appearance between it and a cream curd is that the oil globules are generally much larger in the oil curd. Milk, as is known, is an emulsion of oil and a fluid which is mainly casein. The emulsion is made by nature in the animal processes. The microscopical examination of a cream curd shows that the mechanical mixture is very intimate and evenly distributed. The oil curd is also the production of an emulsion of oil with a fluid medium which is mainly casein (skim milk.) The difference between the two, under a microscope, shows the emulsion is more perfect in the cream curd; in other words, that nature surpasses Freeman. But the oil curd shows an emulsion also, similar but not so perfect as the cream curd, which would indicate that Freeman is treading on the heels of nature. Whether Mr Freeman's process can be improved by means which will lead to a more perfect emulsion is a question. We introduce this item of microscopical examination in order that a better understanding may be gained of the way in which, as it appears under the glass, the oil and skim milk come together for mutual advantage. We return to the vat.

After the introduction of the oil with the milk at a temperature of 92 degrees, it is the practice to heat to 94 degrees. This rise generally takes place without the introduction of more steam. The stirring by hand is given the curd occasionally until it is ready to come out. It is not stirred much; only enough to keep it from baking down. After the curd had been stirred several times, and the coating of oil upon the surface of the whey was quite thick, the oil was gently pushed to one end of the vat and removed with a flat skimmer, shovel shaped. The curd was stirred again, and the whey skimmed again. Upon weighing the skimming it was found that 28 pounds of oil had been taken up by the curd; it was 28 pounds of oil to 2,500 pounds of skim milk. The skimming is held over and used the next day. After the skimming off the surplus oil the treatment of the curd is such as is commonly practised until the cheese reaches the shelves of the curing room. The novelty in the process consists of course in the introduction of the oil. It is a simple matter the agitation during coagulation to keep as much oil as possible

where the curd may enclose it, and the gentle handling afterward so that the bonds may not be broken. There is no secret about it. It is simply mixing oil and skim milk, putting in rennet enough to bind them quickly together, and letting the forces which operate during the curing process work upon until the curd is broken down, enriched and transformed into a mellow cheese.

The Cheese

At the McLean factory we examined the cheese very thoroughly. There were about 3,000 on hand, and we bored them freely. We acknowledge to have been surprised at the quality disclosed by the tricer. There was plainly a lack of fancy flavor, but the way in which the skim milk has been brought to produce a rich mellow cheese with a good flavor is wonderful. It is not quite right to judge the cheese by the standard of fancy, because if the material of which they are made (skim milk), were worked without the enriching, the result would have been exactly the reverse of fancy. It is difficult to judge the cheese by the standard of skim cheese, because there is seldom a cheese which shows even a trace of skimming. The curing seems to be delayed longer than in full cream cheese, and the greater age given the more perfect seems to be the incorporation of the oil, and the smoother and sweeter the body of the product. The cheese at McLean is above the average of the full cream cheese which we have inspected this season in marketable qualities. The butter which is made of the cream is a strictly fine creamery article. It is made according to the usual creamery practice.

The Profits.

The profits made by the new system of manufacture are greatly discussed by the dairymen in the region about McLean. Mr Lamont remarked to us: "The company have done well by us, and they have done well by themselves too." The milk has been bought from the patrons according to the following plan:—Ten pounds of milk is called one pound of cheese, and for every ten pounds of milk the dairymen receive the highest New York quotation less two cents. This is more than the McLean dairymen ever netted for their milk before. But the dairymen are so well assured that there is money in the practice to the manufacturers, that they are half in earnest when they smilingly ask for a little more pay next season. This we mention because it reflects the views of the dairymen in the country around McLean. We left no stone unturned during our visit, in order to furnish our readers with the facts about this novelty in dairying. We went to learn just what the process and its results are, believing that it is necessary first to know before embarking in controversy or approval. It is such information which we lay before the dairy public.

The company is taking active measures to introduce its system of manufacture more widely. I. H. Vanzer, the large butter maker of Elgin, Illinois, has made arrangements to employ the process in making up his skim milk. He went to McLean and remained in the factory several days, examining the process at every step. His examination led to the adoption of the method. The dairymen of Central New York will soon have an opportunity to learn from observation also, for the company, we understand, are taking measures to start a factory in Oneida county. We shall watch the matter closely, and shall not hesitate to speak plainly as occasion may demand. At this time we have aimed only to define and describe."

Handling Butter in the Irish Market.

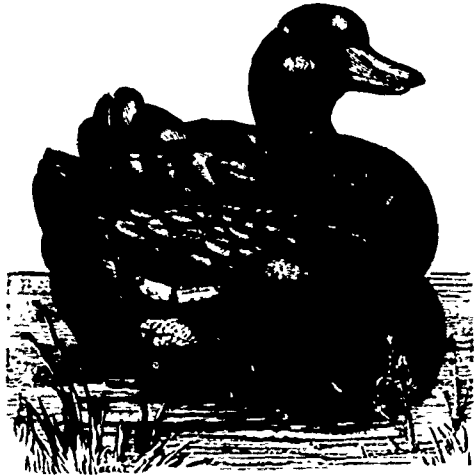
The following extract is from a letter received by Mr. Richards, of the firm of Richards and Gooch, Chicago, Ill., from his partner, who is now in Europe, and gives an interesting account of the manner in which butter is handled in Ireland:

I visited Cork and saw the most systematic method of handling butter I have ever seen. They handle from 1,500 to 3,000 tubs per day. All butter is taken to the butter market for inspection, before going to the party's store to whom it is consigned. This market is a large stone building, but only one storey high. It is divided off in five sections, A, B, C, D and E. These sections are filled with butter as it comes from the depots. There are five inspectors, sworn by the company to perform their duty faithfully. They ballot every morning to see which section they are to inspect, so they never know which butter is to be looked at by them. I inquired of several merchants whether they ever had any difficulties with inspecting butter in this, and they informed me they had not. I think it is the best system in the world. The market is cleared up every day. I find our medium grade of western sound butter would inspect about fourths.

Poultry Yard.

The Black East Indian Ducks.

This variety of the duck breed is known by many other names—Buenos Ayren, Labrador, and sometimes Black Brazilian, all of which are inappropriate, as they are not known in a wild state in any part of the world. In Canada there are but few, if indeed any specimens at the present time, neither are there many in the United States, although several poultry societies there include them in their premium list. In England they are bred pretty extensively, and are to be met with at all their principal poultry exhibitions, they are supposed to be the result of a cross between the wild Mallard and some variety of the domestic duck, and stand as it were midway between the useful and purely ornamental varieties. Some fanciers assign to them the same place amongst water fowl that Bantams hold amongst other fowls, but their best admirers are not willing to accept of this distinction, arguing that not only do they stand



as truly fancy ducks, but also very useful, producing the greatest quantity of meat with the smallest proportion of bone of any demizen of the poultry yards, good layers of fertile eggs, if not more than two ducks are allowed to run with one drake. In breeding for successful exhibition, the chief points sought to be obtained are small size—the smaller the better—and neat shape, round heads, with short bills and short bodies. When first hatched the ducklings have black bodies with a shade of yellow on the breast, the feet, legs and bill being jet black. They require care for the first few days, feeding them on chopped eggs and afterwards on bread and milk, taking care not to overfeed nor allow them to go to the water too early, as they are subject to cramps. They do not bear confinement well in a yard or other small enclosure, and should therefore be allowed their liberty and as much exercise as possible, otherwise they will rarely come to perfection. Like the Cayugas, the Black East Indians are liable to throw white feathers in their second and subsequent moults, not unfrequently becoming almost pure white in the course of years. The drakes are very pugnacious, and on that account it is impossible to keep two of them in the same enclosure.

Poultry Notes—No. 23.

Scientific Principles of Mating—Cochins, Brahmas, Dorkings and Spanish.

There are scientific principles connected with poultry breeding, which must be understood and practised by the fancier who would be successful in producing high class fowls. He must be acquainted with the knowledge of such colors as are readily interchanged, and to choose birds, the imperfections of the one to be counterbalanced by the perfections of the other. Artists are aware that the infinitely

various tints exhibited in coloring are the result of a combination of the three primitive or primary colors, red, blue and yellow; and poultry fanciers know that in fowls black and white is readily interchanged, and that where birds of these colors are crossed, the chickens may be either black or white, or even a cuckoo in their markings. Black crossed with black of different races, or even white with white, has produced birds ranging in color from a pale dun to a deep slaty blue. In this way have new breeds been established, and new varieties of the same breed perfected. Few if any of the fancy poultry now so much admired but originated in this way, and many more may yet be produced as we obtain a more perfect knowledge of the science of breeding. We shall now endeavor to show how the different breeds and the different varieties of the same breed may be improved and perfected by scientifically mating in color and marking, as well as by counteracting imperfections, bearing in mind always that in breeding the first consideration should be the reproduction in the chickens of the most essential characteristics of the breed.

BUFF COCHINS.—The essential in this breed is purity of color, be the shade buff, lemon buff or cinnamon; the cock of the shade required should therefore possess the same feature in his breast and lower parts, while his upper parts should be a rich, sound and rather deep color, much deeper than the color intended to be bred. The principle in mating to produce good buff chickens, then, would be that the hens be a rich buff, not too light, without admixture of shades of color of feathers, but a decided color throughout, mated with a cock of a rich buff, and good sound color throughout, taking particular care that the under flight feathers of wing be not white or mealy.

PARTRIDGE COCHINS.—In this variety good breeders usually make up two pens, known as a cockerel and pullet pen—a course pursued with several other breeds as well. There are different shades of color in partridge as well as buff, the desired shade having been agreed upon, to make up a **COCKEREL PEN**, the cock bird, possessing the other Cochin characters, ought to have a really black breast, fluff and leg feather, with hackles a rich red, striped with dense black; the neck hackle may approach to orange red, dark towards the throat in front, and saddle feathers of nearly same color, but not quite so dark, while the web of hackles should be jet black up to the stem or shaft. Hens to mate with such a cock ought to show a very deep rich brown ground color, almost the color of roasted coffee, with rich reddish orange hackles; the markings on feathers a minute pencilling, almost black in color and close together. After a few years' mating birds in this manner, exhibition cockerels will no doubt be bred. To make up a **PULLET PEN**, the hackle of the cock should be reddish orange rather than red, densely striped with black; mated to hens whose feathers must show very accurate markings, particularly the breast feathers, which must be solidly and accurately pencilled with several perfect semicircles or crescentic markings, the other feathers showing much the same character, the whole marking to be rather large and broad, and very intense in color.

LIGHT BRAHMAS.—The object sought to be obtained by the breeder is a sufficient amount of black markings in the hackle, without producing color where not wanted, and purity of white. Two pens are mated for this purpose, a cockerel and pullet pen, and the scientific principles adopted are as follows:—**To breed pullets.**—In the cock's hackle the stripes should be narrow and tolerably distinct, the saddle feathers quite clear, and the leg feathering nearly white; this bird put to hens darkly striped in the neck, and if they can be got so dark, entirely black even in the very fringe, such a cross ought to produce pullets with hackles fit for the show-pen. To

breed cockerels.—The cock's hackle stripes should be of a very solid character, and well defined stripes in the saddle also. This bird, mated with hens too light and cloudy in the hackle for the show-pen, but free from any color but white in the hackle (none but birds with a pure white should be chosen for breeding purposes, the raw color so frequently seen being sure to reappear in the chickens), will produce well-marked cockerels, which may be exhibited with every prospect of success.

DARK BRAHMAS.—There are in this variety different shades of color, and in mating, of course the shade agreed upon will have to be considered. The essentials are,—purity of markings in feather, and proper distribution of color from a scientific point of view; and the general characteristics which should guide in the selection of the cock are, whether he be mottled or black; in the breast he should be darker, or at least fully as dark as the thighs, the hackle well striped, and that the hens mated to him have good dark breasts. But to be more particular, and breed the favored varieties known as the *silver grey* or *blue grey pullets*, the cock should be entirely free from brown even in wing bar, the tail a very bright greenish black without purple reflections, the bar of wing positively green, while the hackle and saddle feathers ought to be solidly and distinctly striped, breast black, with fluff also black or slightly mottled, in the latter case the middle of every feather quite black; mated with hens that have good dark breasts, as already stated, will produce chickens of the above shades of color.

COLOR DORKINGS.—With this variety of dorking care in choosing stock birds must be exercised, and therefore it is desirable that the cock and hen should be descended from the same stock birds, otherwise the result may be of a very undesirable kind. Being a composite fowl, any sudden cross would produce "reversion," and hence the necessity of having both parents descended from the same stock; dark feathered are preferable, but to show a bright shaft nearly the whole length of feather. The hen's breast to be salmon red, each feather tipped with dark grey or black; the wing feather black round edges, with a rich brown centre pencilled or shaded with black, and the back and saddle almost black. The cock mated to hens of this color, in order to breed the dark color above described, should have very black hackles, and all white in the tail avoided. In a former note we made some remarks in reference to mating this variety, *silver greys*. In all sub-varieties, let it be understood, purity of blood is only a question of degree, and hence the necessity of treating all such cases on purely scientific principles, inasmuch as there is always danger of "breeding back." The same remark, therefore, will apply to this variety as to the colored as regards the descent of the parents being from the same stock birds. To breed silver greys a cock should be procured as silvery as possible but with pure black breast, and mated with hens of medium color, not too pale, else many of the cockerels will have grizzled breasts. Large birds, if possible, should be procured, but if size has to be dispensed with on one side, let it be that of the male bird.

BLACK SPANISH.—The two essential and important features to be produced in this breed are the comb and white face. The plumage being black, it requires no knowledge of the proper mating colors as in other breeds, although there are different shades, some much more preferable than others. Although comb does not come within the scientific matching for colors to which these notes are confined, yet it being one of the prominent characteristics, we cannot pass it over unnoticed. The character of future combs may be influenced by selecting a cock of moderate sized comb, the base as thick as possible, but tapering off to a fine thin edge, and mating him with hens possessing same points in combs; such birds will produce chickens with desirable combs. White faces are of two kinds, the rough or cauliflower, and the soft smooth face. The most satisfactory results will usually be found to follow by putting the smooth faced cockerels to the larger rough faced hens, instead of adopting the contrary plan. Crossing strains of very alien blood should be avoided, as it often produces great deterioration of face, which however may be removed in the second generation by re-crossing back to one of the parent strains.

The Apiary.

Precautions against being Stung.

There can be no doubt that fear of being stung is a very great hindrance, probably the greatest, to the extension of bee-keeping. Nor is this at all surprising, when you consider what serious and even fatal consequences result, in some cases, from being stung. It is no mark of wisdom to despise a bee sting. To do so is to display ignorance, inexperience, or foolhardiness. No person who has been stung in a highly sensitive part of the body, when the poison injected has been peculiarly virulent, will pooh-pooh the affair. One such sting is enough to teach a lesson of caution that will last a life-time. The wise course is to look a danger in the face and guard against it. Precaution can easily be taken if the habits of the bee are properly understood. A bee will sting only under two conditions, exasperation or pressure. The second of these conditions would almost seem to render stinging involuntary. If you press the body of a dead bee, you will find that the sting will dart forth with astonishing celerity and force. Squeezing a live bee is very like touching the trigger of a loaded gun at full-cock. A discharge is the inevitable and immediate result. There are a few simple rules the observance of which will reduce the danger of being stung to a minimum, if not remove it altogether.

1. The first is completely to master the emotion of fear. No person should undertake to handle bees who cannot maintain a perfectly calm, self-possessed, cool and determined bearing, under all circumstances. Bees know by some subtle discernment whether you are timid or courageous, just as a spirited horse knows whether timidity or courage has hold of the reins. A show of fear is pretty sure to exasperate bees. They seem to resent being meddled with by a timid hand.

2. Gentle and quiet movements alone are safe and proper among bees. They are excessively nervous and irritable, and should be treated accordingly. All rough ways, all sudden jars, all hurried motions are to be carefully avoided. Just as you would make everything as pleasant and soothing as possible to a nervous and irritable human being, so should you act among bees. Especially should this rule be observed in opening out a hive, and performing any manipulations on the interior. To insects accustomed to a dark, perfectly quiet habitation, with everything firmly fixed and in a most orderly state, it must be a rude interference at best for a hive to be opened, flooded with sunshine, and put completely out of kilter. If they can reason, they should be made to do it on this wise: "Man is our hege lord; he has a right to control us; he means us no harm; it will be all right." In all but rare and exceptional cases, they succumb to firm and gentle treatment, and soon form a habit of acquiescence in the bee-keeper's will.

3. It is well to avoid meddling with bees, when from any cause, known or unknown, they are excited. Sometimes it may be necessary to subdue them under such circumstances, but these cases are infrequent. In any necessary interference with them, choose a time when all is serene, and they are pursuing the even tenor of their way.

4. When from any unavoidable cause they become exasperated, a steady, decided course is absolutely indispensable. Stand your ground. Have smoke at hand and ply them with it until they become pacified. It is like a controversy with a passionate, self-willed child. If you give in, worse contests will follow, and the hive, like a spoiled child, become unmanageable. Now and then a hybrid colony will have an ungovernable temper. If it cannot be subdued, it is better to sentence it to death at the end of the honey season, than to have the nuisance of an intractable stock on hand. Such cases are however

extremely rare, and are generally the result of bad management. Spoilt bees, like spoilt children, show bad training.

5. The utmost care should be taken never to crush a bee if it can possibly be avoided. Some bee-keepers are very careless in this respect. With a strong colony numbering thirty or forty thousand, what signifies the loss of two or three bees? Well, the slaughter of a single bee will sometimes infuriate that whole colony. To crush a bee is, as we have seen, to necessitate the thrusting out of the sting, and the consequent emission of the poison. No sooner is the odor of that poison detected by the colony, than the tone of their music changes from a peaceful hum to a warlike strain, their tails are elevated high in air, and from every tail the poison odor at once emanates, which rouses and lashes up the war spirit until the entire army is ready and anxious for the fray.

6. Whatever style of hive is adopted, it should be such as to facilitate operations among bees. The simpler the better if it only answers all necessary, practical purposes. Complications and nice adjustments are to be avoided as far as possible. A hive easily opened and closed, giving ready faculty of access to all its parts, without much danger of crowding or crushing the bees, is the one best adapted for the purpose, whether it be covered all over with patents or entirely free from that style of ornament.

7. Precautionary measures in the way of personal defence, and taming the bees, are worthy of adoption by all inexperienced bee-keepers, and by all, however experienced, who know themselves to be obnoxious to bees. Inexperienced bee-keepers are apt to make slips, to have accidents, and to lose presence of mind, so that, however anxious they may be and usually are to prove their skill by handling their bees without protection, it is advisable for them to use a bee-veil and gloves impervious to stings, for a time at any rate. In regard to the other class of bee-keepers, it is a well known fact that bees as well as human beings have their likes and dislikes. There are those who are bee-loved, and there are those who are bee-hated. The sense of smell is very acute in bees. By this they are guided in the recognition of the fellow-occupants of their own hive, and in the rejection of the natives of other hives. There is little doubt that it is their keen sense of smell which leads them to take to certain persons and to turn against others. The law of affinity which guides these little insects is not well understood, but that there is a such a law is indisputable, and we must conform to it. These bee-keepers are to be envied who are favorites with the busy little workers, and it is these who should feel called to go largely into the business. But those who are bee-hated need not on that account forego the pleasure and profit of keeping bees; they must prosecute bee-keeping under difficulties. But after all, some of the most eminent apirians have overcome greater obstacles than the dislike of their bees. Witness Huber, the father of modern bee-keeping, who made such wonderful discoveries in apiculture, and yet was a blind man. The wearing of a veil and gloves is an inconvenience, but it must be submitted to by those who have the misfortune to be objects of dislike to bees. It may be added that the use of smoke as a means of subduing bees, will often enable bee-hated persons to handle their hives without protection. Much judgment is needed, however, in the employment of smoke, as an overdose of it, or an injudicious use of it, has a tendency to irritate the bees.

8. Finally, a word remains to be said concerning antidotes for bee stings. It would be a long detail to mention all the remedies that have been suggested by way of curing bee stings. In a general way, it may be stated that almost any alkaline application is good, though antidotes do not always have the same effect on all persons. Bee-keepers must judge for themselves after trial of various remedies what are

most effectual in their several cases. Without having any interest in it except a benevolent interest in the relief of suffering humanity, we strongly recommend the German bee-cure advertised by Mr. Hawley, of Utica, N.Y. We can testify along with many others that the relief it gives is well-nigh instantaneous, not only subduing the pain but preventing the swelling. Of course, like other antidotes, it may not operate alike on all persons, but thus far we have heard of no exception to its curative efficacy.

North American Bee-Keepers' Society.

The fourth annual meeting of the above named society was held in Pittsburgh, Pa., Nov. 11-13. There was a fair but not large attendance, Pennsylvania bee-keepers preponderating, as might have been expected. The president, Seth Hoagland Esq., of Mercer, Pa., occupied the chair until the election of officers, when Rev. W. F. Clarke, of Guelph, Ont. was elected to succeed him. During the sessions a number of subjects pertaining to practical bee-keeping were discussed, but nothing particularly new was elicited. Papers were read by Rev. W. F. Clarke on "The Sting of the Honey-bee," by Rev. H. A. King, of New York, on "the adulteration of honey," and by A. J. Murray, of Memphis, Tenn., on "old-time bee-knowledge."

Mr. King's paper led to the appointment of a committee, whose report was unanimously adopted. As this is a matter of some importance to bee-keepers in general, we give the report in full.

Whereas, it has come to our knowledge that certain honey dealers in New York and Chicago are using large quantities of sugar, syrup or glucose, with which they mix a small quantity of honey and sell the whole for pure honey, thus making 1,000 pounds of honey sell for from 3,000 to 5,000 pounds; and

Whereas we, the North American Bee-Keepers' Society, in annual session assembled, believing that the adulteration of honey can tend only to the ruin of the honey producing interest of the country by overstocking the market, reducing prices, ultimately lessening the consumption, and dishonouring our calling as well as their own; therefore,

Resolved,—That we hereby express our unqualified condemnation of the course of these honey dealers, and hereby notify them that they must cease to adulterate honey and assure us of the fact, or, for self-protection, we shall be compelled to publish their names and expose them to deserved contempt. The committee advise honey producers to sell no honey to dealers guilty of adulterating. The committee recommend the appointment of a standing committee authorized to communicate with honey dealers, and take such action as they may deem necessary to carry out the spirit of this resolution.

The subject of queen raising awakened considerable interest, and was fully discussed in all its bearings. A decided majority of the bee-keepers present were of opinion that further importation of Italian bees was needless, there being now in the possession of apirians on this continent as good strains of stock as could be found on the continent. Indeed, some expressed the belief that improvement had been made upon the imported bees by change of climate and other influences. The great difficulty and cost of importation render it undesirable, unless positive benefit is to be expected thereby. A proposal to select a place for queen-rearing, and appoint a committee to take charge of the work, did not meet with favor, it being thought better to leave bee-breeding to private enterprise, as is done with other stock. A similar view was taken in regard to a motion to appoint committees to conduct experiments in apiculture. It was thought that interest in the advancement of bee-keeping, and ambition to make discoveries and improvements, were sufficient motives to secure all the efforts that were practicable.

A committee was however appointed to arrange for the exhibition of queens and stocks at next annual meeting, and to make out a prize list. This measure, it was thought, would stimulate to care in breeding, and add greatly to the interest of future meetings.

So far as reported, the business of bee-keeping appeared to in a prosperous condition. One member states that he had made an average of \$51 per hive the present season—a remarkable profit, not often secured even in a small apiary.

Resolutions were unanimously adopted:—

1. Of respect to the memory of the late D. Hamlin, of Tennessee, one of the vice-presidents of the society.

2. Of thanks to Ex-President Hoagland; to the R. R. companies and hotel-keepers who encouraged attendance by a reduction of their usual rates; and to the local press.

3. Giving authority to any of the officers of the society to organize auxiliary or branch societies, membership in which shall carry membership in the parent society, provided that the membership fee shall be one dollar annually, and that one-half thereof shall be paid into the treasury of the parent society.

4. Appointing standing committees to check the adulteration of honey by unprincipled dealers; to arrange a system of premiums for the best queens and stocks at the next annual meeting; and to arrange for the meeting next year at Toledo, Ohio.

AN IOWA PLAN OF WINTERING.—An Iowan thus tells how he winters his bees:—In the fall, when preparing bees for winter, I take off the straps from the honey-board and cover the honey-board with corn-cobs; they are pressed closely together so that no bees can escape. Place the cobs three or four double over the space where the surplus boxes were, and contract the entrance, except an inch. Put them in a cool, dry, dark cellar, and they are safe in "winter quarters." I have tacked wire over the entrance to confine the bees, but think it unnecessary, for if the light is excluded the bees will not leave the combs. Last winter we wintered forty colonies, prepared in this way, and did not lose one, and the last, it will be remembered, was a very severe winter on bees, many losing every colony. —*Cor. American Bee Journal.*

BEES AND HONEY. The *Cherry Valley (N. Y.) Gazette* gives Mr. Hetherington the credit of being the largest honey producer in the state. It says: "Mr. Hetherington shipped one day last week a car load (ten tons,) of choice white honey. He had previously sent away about three tons, besides two tons of strained honey. There are yet several lots that have not been brought in, so this year's crop cannot fall much short of 20 tons." One of his partners who had the care of 177 hives of bees, last spring, obtained, in surplus, over 17,000 pounds—box and extracted. He took the pains to weigh accurately the products of one hive that seemed to be doing better than the others. He commenced June 29, and obtained 5 lbs.; July 4, 11 lbs.; July 5, 30 lbs.; July 16, 31 lbs.; July 23, 58 lbs.; July 25, 57 lbs.; July 29, 65 lbs.; August 1, 65 lbs.; August 5, 72 lbs.; August 8, 46 lbs.; August 11, 62 lbs.; August 17, 43 lbs.; August 26, 37 lbs. Total, 585 lbs. in about two months.

CATNIP FOR BEES.—For some years past I have been giving much attention to honey-producing plants, and am constrained to believe that the catnip plant has not received the consideration that its importance justly entitles it to. For three years past, I have been sowing the seed on waste places, in all directions, for the distance of a mile or more from my apiary and I have never seen anything equal it. It commences to bloom here the last week in June, and lasts fully three months, giving a continuous yield from the time the white clover falls, till frost. It thrives in any part of our country; stands our continuous summer droughts better than any other plant, and never fails. Our bees are on it every moment of daylight there is, from one month's end to another; not even a smart rain will drive them from it. Notwithstanding it is now the driest time that has been known here for many years, the bees make a constant roaring over the little catnip field which I am cultivating. We shall plant more of it for cultivation next spring, or rather winter. January and February is the best time to sow it. Quinby says, "if there is any article that I would cultivate especially for honey, it would be catnip. I find nothing to surpass it." —*American Bee Journal.*

1875.

1875.

THE CANADA FARMER.

ESTABLISHED IN 1864.

A large monthly paper, clearly printed and well filled with an immense variety of Editorials, Correspondence, and Extracts from other Journals, on

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AND

RURAL AFFAIRS.

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To arouse attention, by frank and temperate discussion, to all questions, scientific, commercial, legislative, or otherwise, specially affecting the farming interests.

To stimulate the agriculturists of our country to adopt an improved system of husbandry, by blending the lessons of modern science with the practical experience of the Canadian farmer.

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Toronto, November 2nd, 1874.

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The Canada Farmer.

TORONTO, CANADA, DECEMBER 1, 1874.

THE FARMER FOR 1875.

As will be seen from announcement published elsewhere, it has been resolved that THE CANADA FARMER, during the coming year, shall be published monthly at a dollar *per annum*, instead of fortnightly, as heretofore, at one dollar and fifty cents. This change has been rendered expedient by the exorbitant postage charged for conveying periodicals by mail; and the vexatious discrimination made against publications appearing less frequently than once a week, in contrast with such as appear weekly, semi-weekly or daily. The change has also become advisable from the fact that the cost of a semi-monthly has been found by experience to place it beyond the reach of such Agricultural Societies as desire to supply an agricultural paper to their respective members.

The first number of the new issue will appear on the 1st of January. It will consist of 24 pages somewhat larger than at present; the paper will be of the best quality; and it will be printed from a new fount of type. The utmost exertion will be made to render the Journal, during the coming year, more interesting and efficient than it has ever yet been; and we solicit the aid of our friends throughout the Dominion in obtaining for it a very wide circulation.

Most liberal inducements are offered to parties obtaining subscribers for the new issue—full particulars of which can be learned by applying (personally or by letter) to "the Publishers of the Canada Farmer, Toronto."

REPORT OF THE UNITED STATES COMMISSIONERS OF AGRICULTURE.—Our thanks are due the Department of Agriculture at Washington for the Report for 1872. The volume contains over 500 pages of valuable statistical matter, and other interesting agricultural information.

Seasonable Hints.

The present fall thus far has been unprecedentedly auspicious for farmers, and it may not be out of place in reviewing the many advantages it has afforded them in every way, to undergo a process of self-examination, and find out how far and in what direction these advantages have been practically utilized. Perhaps the ordeal can be conducted with greater facility by suggesting a few of the many things that ought to be accomplished, and then asking the question—"Have I attended to this?"

First then as to Manure, which is *par excellence* the farmer's floating capital, and without a proper accumulation and disbursement of which his trade would be comparatively gone. Manure-making should be prosecuted with vigor. So long as the weather is at all favorable, and time at all permits, every spare hour should be occupied in collecting muck, pond-mud, soils, leaves, ditch-scrappings, and, in short, all kinds of organic deposits, to be mixed with soil, thrown in the hog pen, under cattle, or on the regular manure heap. And every particle already laid up should be studiously guarded against the actions of sun and rain for the effects of both are the same. The one stimulates chemical agencies, and a loss of strength is sustained through the quantity and quality of the gases given off; the other weakens the heap by leaching.

Next, as to sheds. How are your sheds arranged for sheep and other young stock? Each of these should be at least from twenty to twenty-four feet wide, erected on low posts and opening into a yard on the sunny side, protected from sharp winds by other buildings, or a high fence. The beasts would thus have an opportunity of taking fresh air and enjoying themselves both in it and in the sun, it, and could likewise seek shelter at pleasure.

Cellars under houses, and all permanently constructed out-door pits for root-storage, should be thoroughly cleansed, and their interiors, especially that of the former, well whitewashed to purify them from any foul or noxious gases that may have accumulated from former deposits, and render them more fitting for the reception and proper preservation of the new crop. There is much greater loss from the neglect of such precautions as these than most farmers have any idea of. Too often the pits or cellars are blamed when they are not to blame at all. It is their condition, their filthiness that causes the mischief. By way of experiment, or as an illustration of this, let any one place, say a can of preserved plums or raspberries, in each of two cellars similar in every respect, but let the one be properly purified as above, and the other remain without any attempt at its cleansing—and see which can will preserve longest.

Next, as to out-buildings in general. Now is the time to make upon them any repairs they may need. Are shingles loose, or off altogether? Nail them fast. Are hinges broken, door-latches useless, weather-boards flapping with the wind, gates damaged, &c., &c.? You will not have a better opportunity to repair and render them all secure than during the fine fall. Put it off until winter is upon you, and what with cattle all housed and requiring attendance, your time will be too much occupied to devote it to these minor matters.

Before we close this article there is a hint or two which might prove serviceable in reference to the winter-feeding and care of cattle. See that your buildings are not too close, but thoroughly ventilated. The food too should be served out daily four or five times. "An awful work, you say?" Well undoubtedly it is, but it pays. By feeding as often as this and little at a time, every portion of the food is consumed and none wasted. Consequently it will go much farther and do much better service than if you were to feed but twice or thrice with gorges each time. See also that the food is properly varied. Animals, like human beings, have their likes and dislikes. Of

course there are certain kinds of food they like much better than others. But no matter how well any kind is relished, a beast becomes surfeited with it if fed constantly; and just as soon as the surfeit arises the appetite is impaired, and the nourishment or fattening process is checked. Food in such a case is a loss. Vary the feed then and follow the plan stated. Give often, but little at a time, and change frequently, and you may rely on a speedily fattened animal. For horses and neat stock place lumps of rock salt in their mangers, which they can lick to their heart's content as the system demands it. Clean your stock occasionally, we mean their skins. You need not smile. This course promotes health and facilitates fattening. Experience has proved it, and the force of proof has been such that the most prominent cattle breeders and feeders in England have now adopted the process. In feeding hogs, you will save considerably by sprinkling a mixture of lime and ashes occasionally over the pen floor, for even pigs, much as they love to wallow in their own mire and inhale their own stench, will improve rapidly under this treatment.

More "Dodging."

We recently took occasion to lay before our readers some of the dodges practised by unscrupulous exhibitors of cattle in the English show ring. It would appear however that stock men are not the only transgressors in this respect. In reading our foreign exchanges we have often been struck with the accounts given of the immense size and faultless proportions of the "specimen roots" exhibited at some of the leading fairs, and we now learn that the manner in which these "evidences of what may be done by skillful farming, not the results of *nurture*," are cultivated, is somewhat as follows: (1) Holes dug in the earth are filled with compost; the plants, raised in flower-pots, are placed in them at a distance of a yard apart; these pots receive great attention throughout the summer; the result is "magnificent agricultural" (?) roots. (2) A few perches of suitable land are selected (very often newly-broken-up old pasture;) this plot of ground receives nursery treatment, and the plants are allowed a space not compatible on a large scale even in farming of the highest order—roots thus cultivated are exhibited as specimens of what? (3) A strip in a field is chosen, a few ridges receive an increased quantity of farm-yard manure, extra artificial is used, and the plants on these selected ridges are "set out" at a much greater distance than the rest of the field; liquid manure is sometimes supplied to them during the period of growth, and roots "for competition" are taken from these pampered specimens of what? (4) Roots culled from the root-quarters of two or three farms and shown by one exhibitor as specimens of what? "By these modes of procedure," says the *Oxford Journal (Eng.)*, from which our information is chiefly derived, "the farmer who draws his roots for exhibition from a business-like area finds himself outdone; deceptions are practised upon the public, those who have a 'peep behind the scenes' are disgusted; and those who receive prizes for roots so cultivated and shown as specimens of agricultural roots, obtain those prizes under false pretences."

The Russian Mennonites in Manitoba.

Letter from Jacob Y. Shantz.

The following letter from Mr. Jacob Y. Shantz, of Berlin, addressed to Mr. Samuel Reesor, of [Markham, appeared in the *Economist* of that place. It will doubtless be read with interest:

RED RIVER, Oct. 29, 1874.—As I am now on my way home (Berlin, Ont.), and have been amongst the Russian brethren, I will tell you a little of their circumstances and how they managed to get up warm houses so soon. On the part of the reserve on which they are located, there is considerable wooded land, consisting of small tamaracks and poplars, so that

most of them build houses of timber and long grass, which is plentiful there. The poorer classes took long poles and put them up in a roof like way and covered with grass, tied to the poles crosswise on the pole or rafters, which makes a good roof down to the ground. They then took small logs and built up under that roof about seven feet high and plastered inside and outside with clay. Those who cannot afford boards, lay poles on the post to e. things, then lay on a little hay and plaster on the top of that with clay mortar. The floor is also made of clay mortar, with sand on the top of the clay, which mixes and makes it almost like sandstone. Some of the wealthier ones built up houses square with logs, but all the roofs and most of the gable ends are made with grass. Those living on the west side of the Red River, have no timber for building, they build with boards and scantling; some have nice little frame houses boarded inside and outside, with layers of thick paper between, which are not yet finished. Thus they have built in various ways according to their means and opportunities. What astonishes me is, that they all have warm rooms, finished or nearly so, also warm stables similarly built for the cattle, and such large hay stacks. Even some that have no cattle yet have hay, as they have hopes of getting them. Some were only three and others four weeks on their places, as some remained three weeks in the sheds, before they selected a place. Their families remain in the sheds all winter. They have built up outside with sod, and boarded inside and made a hay roof over the top of the other, so that they have perfectly warm rooms. It seems sad to meet some of them in such simple houses, without a floor, table, or bedstead, eating dry bread and drinking coffee or tea—i. e. many meals—most of them have potatoes and milk, and some of them pork, so that we have good meals sometimes, but often nothing but bread and coffee; but on the other side, it is chering when they say, "Oh, we are so satisfied, here we have good land, such nice lumber and grass to build with, and are so healthy that we can all work;" others would say, "we eat so much, the appetite is so good, it costs so much." Few complain; nearly all are well pleased with the country and climate so far. The weather has been very nice during the past five weeks, there was no rain, and the roads are dry and fine as can be. We were with the settlements on both sides of the river, and do not believe the horses shoes got wet during the whole time. Yesterday afternoon it snowed a little on the Red River, about 150 miles from Winnipeg. The snow, as we are coming down, is one and a half inches on the deck of the boat this morning, but not so cold as yesterday, and the snow is nearly melting. We are near Grand Forks now. * * * Yours truly,

JACOB Y. SHANTZ.

A Very Useful Table.

The following table, computed from actual experience, will be found very useful in calculating the weight of loads, &c.—or the weight of any of the articles mentioned, in bulk. It shows the weight per cubic foot. All that is necessary, therefore, is to measure the bulk; ascertain the number of cubic feet in it; multiply this by the weight per foot, and divide by 2,000, when you have the weight in tons.

SUBSTANCE.	WEIGHT PER CUBIC FOOT.
Cast Iron.....	480 lbs.
Water.....	62 1/2 "
White pine, seasoned, about.....	50 "
White oak.....	52 "
Loose earth.....	95 "
Common soil, compact.....	125 "
Clay, about.....	135 "
Clay, with stones.....	160 "
Brick.....	125 "

The following shows the bulk of a ton of different substances:—

Sand.....	28 cubic feet to the ton.
Earth, compact.....	15 " or 32 ft. when loose.
Clay.....	17 " " "
Half rotted manure, solid.....	36 " If coarse, about 50.
Timothy hay, moderately pressed.....	500 "
Clover, about.....	750 "

All that is necessary, therefore, in order to ascertain the quantity you have on hand in tons is to take the measurements as above, and if hay, divide by 500 or 750 as the case may be; if manure, by 36, &c., &c.

PLEURO IN FIFE.—At a meeting of Fifeshire Local Authority held recently, it was reported that pleuro-pneumonia had broken out at six different farms in five parishes.

Green and Dry Wood for Fuel.

Fuel is fast becoming one of our most important considerations, from a money point of view, in Canada. Indeed, it has almost become a truism now that, in all settled districts, he who has the largest bush or the greatest amount of timber on his farm, is the richest farmer. Now it is a very common habit with many farmers to burn their wood green. We have seen them repeatedly take their oxen away to the bush, chop down a tree, draw it home, and cut it up for the stove before breakfast or after supper time. Perhaps they were not aware of the loss they were sustaining from an ignorance of the vast amount of latent heat consumed to drive off the water their wood contained. When perfectly green, wood loses about one-fifth of its weight by thorough seasoning, which is equal to about 25 cubic feet in every compact cord. Now all this must be evaporated before the wood burns. The heat thus made latent and lost being five times as great as to heat the water to boiling, is equal to enough for boiling 780 gallons in every cord of wood. He, therefore, who burns twelve cords of green wood in a winter, could have secured the same heat benefit from eight had they been dry. Here is a strong argument then for burning only seasoned firewood. It also accounts for the fact that in the market green wood, however good the quality, commands a lower price than dry. It is not because, as many suppose, it does not burn so well, or because it wastes a great deal more time to attend to it. These considerations, of course, help to lessen its value, but the real point is, as we have stated, a dead loss of about one-ninth in latent heats.

Great Cheese Show and Fair at Kilmarnock.

The annual exhibition of cheese, butter, grain, held under the auspices of the Ayrshire Agricultural Association, took place last month. The number of entries in the cheese section was 475, butter 344, grain 67, roots 125, and extras 18—total 1,029, as compared with a total of 1,100 last year. This decrease is attributable, we understand, to the fact that hitherto a large proportion of the entries came from exhibitors who competed under their landlord's subscriptions, but this year, so far as Ayrshire was concerned, competition was restricted to members only. This year there was also charged an entry money of 5s.

The Cheddar lots, says *The N. B. Agriculturist*, as a whole, were uniform and pleasing in appearance. With regard to quality, there was a slight falling off. In class 1, the whole of the first five lots were superior, and the cheese was very fine. In class 2, the judges found two extremes—a good section and a bad section. All of the prize lots were found to be rich, but as regards flavor there was a deficiency. The Danlops, the original triumphs of the dairymaids of Ayrshire, were found to be scarcely up to the standard of former years, and this is to be accounted for by the fact that that system is gradually being discarded in favor of the Cheddar method.

The loaf cheese, made according to the Cheddar or other imitation English method, were excellent, and a marked improvement on the exhibits of the previous year was readily noticeable. Uncolored cheese are now not readily marketable, and so the specimens shown do not represent the full range of the competitors, who only make a cheese without using annatto occasionally during the season, with which to try and secure the premium offered. Minus the color, they were exactly similar to the cheese shown in the previous class. The loaf cheese, made according to the Cheddar method, were, as in class 4, an improvement upon those exhibited at former shows, but were depreciated by a slight brittleness, which was not to be identified with the hardness necessary for keeping. Class 8, is altogether identified with Ayrshire dairies, as to the farmers of that county competition is limited. As was expected by dairymen, there was a marked falling off, and this was to be accounted for by the peculiarity of the season. Grass, as has been said, was never good at any time, and the temperature was not favorable for ripening. On this account the flavor was too high, which shows that the milk-giving cattle

had been fed on artificial food stuffs. A number of the specimens were also found to be "fire-fanged," or forced too much by the cheese-house stove.

The show of butter was not so great as last year, but the quality was better. This latter characteristic was especially observable in the open classes of fresh butter. The judges, however, insisted, as in former years, that the dairymaids did not seem to understand fully the distinction between powdered and salt butter. Powdered butter should be, they said, only slightly flavored with salt, and not cured; whereas a large number of the samples exhibited as powdered butter were salted sufficiently to keep for months. Many of the samples of fresh butter also had lost their delicate aroma by being iced.

The seeds and roots were a splendid display. There was a good many lots of beans exhibited, but nearly all the samples showed signs of over-dressing. In the cheese fair about 50 tons more than last year were offered. A good trade was done during the day at fair prices. The ton lots sold at about £2 per ton under last year's rates, but the general tone of the market was up to that of last Show. About 6,000 cwt. were offered for sale, compared with 5,050 in 1873 and 4,000 in 1872, and the value of the cheese would reach about £12,000.

THE FIRST SNOW of the season fell in Toronto on the 22nd ult.

IN AUSTRALIA every farmer can raise three crops a year, but two of the crops are snakes and the other very poor cereals.

THE WATERVILLE correspondent of the *Sherbrooke News* states the finding of a bed of terra-cotta, equal to any found in Tuscany, on Mr. Paige's farm.

THE SALE of the Sittyton (Scotland) Short-horns takes place on the 3rd inst. Fifty young bulls of more than average quality will be disposed of.

MR. DELONG, of Ameliasburg, brought to Belleville market on Wednesday two pigs of extraordinary weight. One (one year and ten months old) weighed 520 lbs.; the other (one year old) weighed 381 lbs. They were of the Berkshire breed.

MR. NAPOLEON PINEO, of Rustico, P. E. I., a fisherman in the employ of Mr. Howard, Churchill, caught during the past season 33,700 mackerel—a catch that has never been equalled on the Island by any one fisherman.

AN IRISH TELEGRAM to the *Pall Mall Gazette* states that more than forty sheep have been killed in the Mullingar district by one or two wolves, which are said to have escaped from a menagerie in the north of Ireland. Patrols of police are scouring the country in search of the animals.

MR. JAMES BAKER, sr., has given the milk of one cow to the Fullarton cheese factory during the present season, commencing on the 13th of May and ending on the 30th of October. It may seem incredible, but it is a fact and can be proved by the books, that Mr. Baker netted \$51.70 from his cow, besides keeping the family in milk and butter.

THE HAY CROP of New Hampshire is said to be worth six times as much as its corn crop, as hay can be bought for \$12 per ton and corn for \$1 per bushel. The pasturage and hay of that State are computed to be worth \$12,000,000 annually. There can be no doubt but that by tile draining alone, the hay crop of the United States might be doubled, and if top dressed with good manure, it might be trebled.—*N. Y. World*.

HERE is another fishy story, this time from Nunda, N. Y.: A potato was recently found at Nunda, N. Y., of which the *Danville Advertiser* gives the following account: "It was dug in that town, weighed about three pounds, and contained within itself a very singular thing. A stem, like something protruding from one end was seen to move as if it had life. The potato was cut open and the stem was found to be the tail of a something inside which seemed to be half potato and half animal. It was about as large as a mouse, with a brown color, was shaped like a potato, with indentations like potato eyes, and yet seemed to be composed of animal flesh, and had life and motion. No one had seen anything at all resembling it. It was to be taken to Rochester and shown to scientists." The scientists have not yet been heard from.

THE APPEARANCE of the Phylloxera in Austria has been announced in the *Official Journal* in the following passage:—"One of the vines of the central establishment, created in Lower Austria for the culture of fruit-bearing trees, has been found to be affected by Phylloxera, which had evidently been imported with vine plants received from America in 1869." All the vines of that kind will therefore be immediately destroyed, and the authorities are taking every precaution in their power to prevent an extension of the evil.

THE ENGLISH DERRY is a race of about a mile and a half—single dash. It is for three-year-olds, and colts have to carry 122, fillies 112 pounds. The purse is made up by subscribers, each subscriber having the right to enter and start a horse, and half the subscription is forfeited by such subscribers as do not start. The entrance is 50 sovereigns. The second horse in the race gets 300, and the third 150 sovereigns. In the late Derby, won by the colt George Frederick, there were 212 entries, and 20 started. The winnings are reckoned as follows: 20 horses starting, 50 sovereigns each, 1,000 sovereigns; 192 entered that did not start, each half forfeit, or 25 sovereigns, 4,800 sovereigns, added to 1,000 makes 5,800. From this deduct 450 sovereigns, paid to the second and third horses out, and we have what George Frederick won—5,350 sovereigns, or nearly \$26,750.

ENGLISH WHEAT.—Foremost as wheat is among the cereals of the temperate zone, it is not selected for uniformity of composition; few grains, indeed, vary more according to season, soil, and situation. English wheats, however, come nearest to an average standard of best bread-making qualities; and if we do not turn out the highest-priced flour, it is entirely owing to the want of skill or judgment on the part of the miller. The wheat-corn of southern climates, and during excessively warm periods of growth, preponderate in gluten and hardness of grain over those of colder countries and cool, wet seasons. Hence the hard wheats of Venezuela, Africa, and Taganrog, Payen, who chiefly illustrates from these, declares that they yield over 20 per cent. of nitrogenous substance when chemically dry; but this is an impossible ordinary condition, and leaves the real amount very uncertain. Whatever may be the maximum percentage of flesh-forming compounds in wheat from the sunnier clime, anything exceeding 13 per cent. must be taken from the entire grain. But when the kernel of hard corn shows as much as this, it is altogether unfit for bread-making unless a large quantity of a poorer or softer wheat flour be mixed with it. We find the hard Italian wheat only suitable for making macaroni, vermicelli and similar pastes; nevertheless, good hard Russian corn, coarsely ground and dried, makes the best substitute for oatmeal in porridge, when that is found too heating to the blood of young children, as experienced Scotch physicians tell us is sometimes the case.—*The Sanitary Record*.

THE COTTON CROP OF AMERICA.—The October returns of the Department of Agriculture at Washington give the following State averages indicating the condition of the cotton crop in the United States. The crop of Virginia is too small to influence perceptibly the general result. North Carolina 85, a decline of 2 per cent. during September. South Carolina 82, a decline of 4 per cent. Georgia 80, an improvement of 3 per cent. Florida 81, an improvement of 4 per cent. Alabama 75, a decline of 6 per cent. Mississippi 74, no change. Louisiana 62, no change. Texas 70, an increase of 5 per cent. Arkansas 55, an increase of 8 per cent. Tennessee 56, an increase of 4 per cent. The crop notes shew that on the Atlantic coast the causes of the decline were drought, rust, and excessive rains, in some cases accompanied by beating winds. In the Gulf Coast States a few cases of insect injuries are added to the above, but the weather also was very unfavorable to the development of destructive insect life. In some cases a continued drought of three months is reported. The top crop was dried up and the middle crop greatly reduced. The crop opens freely, and the picking generally was in rapid progress. In some cases the seed had sprouted in the ball. Along the coast of Texas heavy rains fell, accompanied by gales lasting several days. In the inland States, Arkansas and Tennessee, several counties report improvement in the condition of the growth, though in one or two no rain has fallen since May. In others the drought has not been so severe. The above averages refer only to the condition of the crop on the first day of October, including its state of development, vitality, and healthfulness. This is but one element in the calculation of the yield in quantity, which has not yet been completed.

Veterinary Department.

Errors in Shoeing Horses.

The following thirty points, relating chiefly to errors in horse-shoeing, are extracted from a work by Lafosse, written one hundred and twenty years since. They are just as applicable to-day as they were in 1754. Lafosse says :

1. Long shoes, thick at the heels, never remain firmly attached to the feet, in consequence of their weight, and break the clinches of the nails.
2. They require proportionately large nails to retain them; and these split the horn; or, frequently, their thick stalks press against the sensitive laminae and sole, and cause the horse to go lame.
3. Horses are liable to pull off these long shoes when the hind-foot treads upon the heel of the fore-shoe, either in walking, while standing, by putting the one foot upon the other, between two paving-stones in the pavement, between the bars of gates, in the drawbridges of fortifications, or in heavy ground.
4. They move heavily, as the weight of their shoes fatigue them.
5. Long shoes, with massive heels, raise the frogs from the ground, and prevent the horse walking on those parts. Then, if the horse has a humor in the frog, it becomes a nethrush, or a *crupaud* teanker, because the humor lodges there. In shoeing with short shoes, the horse goes on his frog; the humor is dissipated more easily, particularly in the fore-feet, as the animal places more weight upon them than the hind ones.
6. Long shoes, thick at the heel, when put upon feet which have low heels, bruise and bend them inwards, and lame the horse, although the heel be sprung; and, when the foot is raised, we can see the daylight between the shoe and the hoof. When it is on the ground, the heel descends to the shoes, because the hoof is flexible.
7. Shoes long and strong at the heels, when the foot is pared—the frog being removed a long distance from the ground—cause many accidents; such as the rupture or straining of the flexor tendon, and compression of the vascular sole—a circumstance not known until I pointed it out.
8. Long shoes cause horses to slip and fall, because they act like a patten on the slippery pavement, as well in summer as in winter.
9. Long shoes are also injurious when horses lie like a cow, in consequence of the heels wounding the elbows.
10. Calkins should not be used on paved roads; they are only useful on ice or slippery ground—*terre grasse*.
11. The calkins on the inside heels are liable to wound the coronets, when the horse happens to cross his feet.
12. A horse shod with them is soon fatigued, and never goes easy.
13. The horse which has only a calkin on the outside, does not stand fair; and the calkin confines the movement of the coronary articulation, the foot being twisted to one side.
14. If a horse has his feet pared, and loses a shoe, he cannot travel without breaking and bruising the wall, and damaging the horny sole, because the horn is too thin to protect it.
15. If the shoes are long, and the heels of the hoof pared cut hollow, stones and pebbles lodge between the shoe and the sole, and make the horse lame.
16. Flat feet become convex by hollowing the shoes to relieve the heels and the frog, because the more the shoes are arched from the sole, the more the wall of the hoofs is squeezed and rolled inwards, particularly towards the inner quarter, which is the weakest. The sole of the foot becomes convex, and the horse is nearly always unfit for service.
17. If the wall of the hoof is thin, and the shoes are arched, the quarters are so pressed upon that the horse is lame.
18. Pared hoofs are exposed to considerable injury from wounds by nails, stones, glass, etc.
19. The pared sole readily picks up earth or sand, which forms a kind of cement between it and the shoe, and produces lameness.
20. The reason why it is dangerous to pare the feet of horses, is because, when the sole is pared, and the horse stands in a dry place, the horn becomes desiccated by the air which enters it, and removes its moisture and its suppleness, and often causes the animal to be lame.
21. A habit to be abolished is that in which the farrier, to save trouble, burns the sole with a hot iron, so as to pare it easily. The result often is to

heat the sensitive sole, and cripple the horse.

22. It often happens, that to, make the foot pleasant to look at, the horn of the sole is removed to the quick; and the flesh springs out from it. This granulation is called a "cherry;" and sometimes makes the horse unserviceable for a considerable period.

23. It is the pared foot which is most affected with what is termed contracted or weak inside quarter, and which also lames the horse.

24. It also happens that one or both quarters contract, and sometimes even the whole hoof; then, in consequence of its smallness, all the internal parts are confined in their movements. This lames the horse, and is duo to paring.

25. There also occurs another accident. When the quarter becomes contracted, the hoof splits in its lateral aspect. This accident is termed "a sand crack"—*sime*, and the horse is lame.

26. The fashion of paring the hoofs, and especially the heels, within which are the bars, causes contraction; and this renders the horse lame.

27. It is an abuse to rasp the hoofs of horses; this alters the hoof and forms sand-cracks.

28. If a horse which has pared hoofs, happens to lose his shoes, and walks without them, the horn is quickly used, and the feet damaged.

29. Another defect is in the manner of making large nail-holes in the shoes, etc.

30. The impolicy of farriers, in order to pare the sole well, cut it until it bleeds; and, to stop the hemorrhage, they burn the place with a hot iron, and the horse returns lame to his stable.

Parturient Apoplexy in Cows.

Parturient apoplexy in cows is a disease which appears to be on the increase amongst the well-bred cows in this country, and is one of the most serious affections to which the cow is liable, being so rapid in its course, often terminating fatally in a very short time. Amongst highly fed cows, in cities it appears to be exceedingly prevalent.

Parturient apoplexy may be defined to be a blood disease which is characterized by the great tendency to a congestive state of the blood vessels of the brain, and also the spinal cord, and frequently involving the sympathetic ganglia. It occurs in cows of any breed, and especially such as are good milkers and are in a plethoric condition, apparently arising from the volume of blood not being directed to its proper channel for the secretion of milk, and being thrown upon the system, producing cerebral disturbance. Perhaps one of the most noticeable characteristics of this disease is the alarming rapidity with which it is developed, very often attaining its full height in the course of six or eight hours, and it generally appears from the first to the third day after calving, and the earlier it comes on the more fatal it is.

A marked peculiarity of parturient fever is that it has seldom or never been known to follow abortion, and generally attacks cows in their prime, when they are in their most vigorous milking condition. It rarely occurs with poor milkers, but usually attacks those that give a large quantity of milk.

One cause of the increased prevalence of this disease in many quarters, is due to the increased amount of artificial foods, that are used with the aim of keeping cows in very high condition.

No doubt good feeding is necessary in dairy stock to obtain good returns, but in some cases it is carried too far, and disease and death are the result.

This serious complaint can be readily detected, as the symptoms are unmistakable. After calving the cow does not give her natural quantity of milk, and the yield gradually diminishes at each milking, and for a short period there may not be any signs of pain or fever. But soon the true nature of the disease is exhibited; the eye looks dull, she walks with a weak staggering action, and appears weak in her hind limbs and drops to the ground, and may possibly make a few ineffectual attempts to rise. The secretion of milk is impaired or altogether arrested, the bowels are constipated and the urine retained within the bladder, the eye appears perfectly fixed in its socket, the mouth, ears, and horns are intensely hot, the

pulse quickened, and the breathing labored. As the cerebral symptoms become more and more developed, the eyesight is perfectly gone, the nerves of vision are paralyzed, producing a widely dilated pupil, the head is turned backwards over the shoulder, and may be raised for a little and then dashed violently to the ground, there she lies moaning, and perfectly insensible to all surrounding objects.

The pulse becomes almost imperceptible, and if you raise the head it will fall again like an inanimate body; the legs and ears are cold, and occasionally there is a tendency to convulsions, followed by complete prostration. She lies without having the slightest power of motion, all sensibility gone; and death may occur from twenty to fifty hours from the beginning of the attack.

Mares and Foals.

The separation of foals from their mothers is attended with some risk and trouble. To the foals it is a trying ordeal, especially if they have not previously been used to eating corn. Restlessly seeking for their missing dams, they do not feed well, and lose strength and flesh. Left out in the open fields in their imperfectly nourished state, they suffer from cold and inclement weather. Every autumn we see some succumb to inflamed lungs, whilst still more die from poverty of blood—diarrhoea usually being the prominent symptom. Such losses are inexcusable, and in great part preventable. Unless foals have got used to eating oats or other concentrated food, when weaned they should be kept in a yard or roomy box for several days, until they have forgotten their mothers, and become accustomed to their change of food. Whilst thus in comparatively close quarters it is a good plan to halter foals, tie them up, and lead them about. Such lessons thus early given save much after trouble, and enable the colt to be caught or handled at any time. Within a week the colts may be again allowed to run at grass during the day, but night and morning they should regularly have a serving of oats and chaff. Ordinary yards and boxes are unsuitable places for foals, unless, like young thoroughbreds, they are systematically exercised for two or three hours daily. To ensure size, strength, and muscular development, colts, whether for agricultural or other purposes, must have constant exercise. Inaction dwarfs and enervates, they get top-heavy, weak on the limbs and soft in their feet, whilst time and training rarely make up for such early mismanagement. Hence, alike for future usefulness and for health, it is desirable to allow foals plenty of room when first weaned, and throughout the winter to have a run daily for several hours. In grass counties they are generally left on the pastures, but if they are to reach a high value, whether for draught or saddle purposes, they should have a comfortable shed for shelter, and be fed as already advised twice daily. In stock management, as in many other things, what is worth doing is surely worth doing well. Moreover, with the present advanced prices of good horses, it pays to make the best of young animals. For carts and drays in towns considerably over £100 is still given for good, stout serviceable horses, and double that figure is readily obtained for desirable hunters and smart carriage horses. It is only amongst second-rate horses that any declension in price has occurred.

Brood mares at this season also demand intelligent attention. For some days after the foals are taken away from them, the milk of course continues to be secreted, and must be drawn away at first once daily, and by and by at longer intervals. Good mothers troubled with an excessive secretion, with tenderness or hardness of the udder, or becoming fervent or otherwise out of sorts, should have a dozen of aloes. Mares separated from their foals should be restricted to dry food. For several weeks, especially if they have been living on grass, they are not in condition for hard or long continued exertion.—N. B. *Agriculturist*.

Breeder and Grazier.

Singular Death of Short-Horns.

I have been requested to write a short report of the sudden and mysterious death of twenty-five head of cattle, mostly thoroughbreds, from the herd of Mr. A. K. Riggan, of Menard Co., Ill.

There were in the herd about 130 head, cows with calf, and yearling steers and heifers. The inclosure in which they were kept contains about 400 acres, all of which is blue grass pasture, except 40 acres of stalks from which the corn had been gathered some ten days prior to the death of the cattle.

On Thursday evening the cattle were seen and appeared in as good condition as any herd in the State. They were not noticed again, particularly, until Saturday morning, a period of about thirty-six hours, when one fine yearling steer was noticed pawing and horning the earth, foaming at the mouth, and instantly fell; after a day of brief convulsions it died. It was then discovered that twenty-four more were dead in the field; all except four or five were in the 40 acres of stalks; the rest were only a few rods from the fence which separated the pasture from the stalks. The rest of the herd—over one hundred—appear in as good condition now as ever. No symptoms of disease of any kind among them.

On Sabbath, at the request of Mr. Riggan, I made a few *post mortem* examinations. The viscera all appeared normal, no signs of inflammation or congestion in any of them except the small glands situated in the membranes of the small intestines. These glands are known in the human anatomy as *Peyer's patches* or glands. These were found in an ulcerated condition, containing pus. They presented, in the inflated intestines, very much the appearance of small black seed, adhering to the mucous membrane. The contents of the stomach and intestines were what we would expect in cattle kept as these were. I am inclined to think that the contents of the many-fold, or fourth stomach, were drier than when in the normal condition, but am not familiar enough with the healthy condition to be authority on this point.

I am of the opinion, taking everything into consideration, that the cattle were poisoned with *Strychnia*. I form this opinion, however, without knowing whether there is, or has ever been, any disease prevailing among cattle which destroys so rapidly, appears so insidiously and disappears so suddenly.

The stockmen in this community are alarmed, and want all the information they can get in regard to the matter, and any information the readers of *The Prairie Farmer* may be able to give will be appreciated.

Petersburg, Ill.

H. A. HARRIS, M. D.

Short-horn Breeders of Indiana.

The Short-horn cattle breeders of Indiana met at Indianapolis, Nov. 11, about thirty being present. Dr. A. C. Stevenson, of Greencastle, President of the Society, was in the chair. The annual address of the President was devoted to the cattle business and interests of the state. He said the sales of Short-horn cattle in the past two years had far exceeded the expectations of the most sanguine, and the supply is still below the demand. The prospects for the future are as bright as any one could wish. The Doctor recommends separate organizations of Short-horn breeders for self improvement and protection. The annual fee of membership was fixed at \$2 instead of \$1. The subject of holding annual stock sales at Indianapolis was widely discussed, but nothing definite was done. The Association discussed the subject of establishing a new grade of books under the supervision of a committee appointed by the breeders, and the project was quite favorably received. Dr. Stevenson then read an able paper on the science of breeding, a subject which may be termed his hobby, and to which he has given much thought. The election of officers for 1875 resulted as follows: President, Dr. A. C. Stevenson; Vice-President, Chas. Lawder; Secretary, Claude Matthews; Treasurer, S. F. Lockridge; Executive Committee, Dr. Beis, W. W. Thrasher, and H. Cravens.

The Short-horn cattle breeders' convention met again on the following day. W. W. Thrasher read a paper upon the handling qualities of Short-horns, taking the ground that whites and roans are the best handlers, the reds being the poorest. A good handler is one which is mellow, soft, and elastic to the touch, and makes fine beef. Animals with long, coarse hair

are the best handlers. The convention agreed with him in his definitions, but it was also asserted that the yellow reds are good handlers. The following subjects for discussion at the next meeting were adopted: "The value of Short-horn bulls, and what are the characteristics of a breeding bull," paper by Charles Lawder. "The color of Short-horns, physiologically and philosophically considered," Dr. W. C. Bice. "Indiana as a grazing state," S. F. Lockridge. "What constitutes a good and perfect Short-horn cow," W. W. Thrasher. "Preparation of Short-horns for exhibition, and manner of showing in rings," J. G. Williamson. "The proper age of breeding, both male and female," H. C. Meredith.

Structure of a Cow's Horn.

It is very frequently the case that in the commonest, most uninviting of objects, we may see (if we like) beautiful examples of engineering skill. A few days since, says Mr. Frank Buckland in *Land and Water*, I was inspecting the large tanneries of the Messrs. Hamlyn at Buckfastleigh, on the River Dart, Devonshire. In one of the back yards was a mountain of the skulls and horns of cows of all sorts and kinds. Here there was a treasure worthy of investigation; so I got on to the mountain of horns and skulls, and picked out some beautiful specimens which Mr. Hamlyn kindly gave me, in order to make sections, etc. I find that over the brain of the cow a strong roof of bone is thrown in the shape of an arch, so as to form a substantial foundation for the horns. This roof is not solid, but is again strengthened below by a series of bony arches, that are so distributed as to form a series of hollow chambers, thus forming a structure uniting strength with lightness.

The problem now is, how to fasten the horn on each side on to this buttress. The horn itself must of course be formed of horn proper, i.e., hardened hair. In the rhinoceros, we find a horn composed entirely of a solid mass of what is really a bunch of hair agglutinated together; but this kind of horn would have been much too heavy for the cow's convenient use. What is to be done? Why, hollow out the centre of the horn of course; but stay—this will not do, because how is the horn to be supplied with blood-vessels?—in fact, how is it to grow? Let us see how it is done by the great Designer.

Cut the horn right across with a saw, and you will find inside another horn, only made of bone. If the section is made about one-third of the way down the length of the horn, you will be able to pick out a piece of bone in the shape of a cone, on which, or rather round which, the horn proper has shaped itself. This bone fits the cavity with the greatest accuracy; it is as light as the thinnest paper, and yet as strong as a cone of tin. It is everywhere perforated with holes, which in life contained the nerves, the veins and arteries, and we know a cow has all these in her horns; nerves proved by the fact that cows do not like their horns touched, and that they can scratch a fly off their hides with the tip of the horn; arteries and veins, proved by the fact that a horn when broken will bleed, and that the horn of a living cow feels quite warm when held in the hand, besides which the nerves and arteries form a union between the internal core of bone and the external covering of horn proper.

If we now cut the rest of the horn into sections we shall find that the inside of the bony part is really hollow, but that very strong buttresses of bone are thrown, about every inch or so, across the cavity of the horn in such a manner as to give it the greatest possible support and strength. I have cut a cow's horn and skull into several sections to show these buttresses of bone, and now that the preparation is finished I have another specimen to show that there is design and beauty in all created objects.

The Coupling Season.

In handling a flock of over 1,000 breeding ewes, for a series of years, the following course has been pursued, and is here given for the purpose of having it criticised by those who may have something better to propose.

For several weeks before the season for coupling, corn, in proportion of one bushel to each 100 ewes, was fed each day, after they had eaten all the grass they wanted. November 1st the flock was taken to the barn, and about fifty driven into a pen. Among these were turned two or three common rams, securely aproned, and as the ewes in season were found, they were immediately caught and transferred to an adjoining pen. When the flock had thus been handled through, or sufficiently to secure as many ewes as it

was desired to breed for one day—which should not be more than five or six for each ram—they were turned to pasture.

The ewes in season thus being together, reference could be had to the propriety of crossing certain rams. A single ewe was then caught and placed in a small pen, and the ram turned in with her. As soon as served, the ewe was marked and turned out in a pasture in which were allowed none but ewes that had been bred. Where six or eight rams were used, by the time that each had served a ewe the first one was again ready for service—thus enabling the shepherd to turn out thirty to fifty ewes before noon. The same course was pursued every morning, until all, or nearly all the ewes had been bred.

Experience has demonstrated that a larger number of lambs can be obtained from a flock thus handled than from any other system—while the advantage afforded for selecting the most judicious crosses, would recommend it even if a smaller number of lambs was the result. An additional advantage was found in the fact that by this system a choice ram could be made to serve four or five times as many ewes as he could if "turned in" with them, and this with less physical exhaustion.

Where really choice animals are used—and only such should be—any other policy is worse than extravagant, as not only the money paid for such animals is misspent, but the gain that might otherwise result from it placed beyond the reach of the flock master.—*Natural Live Stock Journal*.

Feeding Cows Turnips.

The question is asked, "Does it pay to feed turnips to cows?" Yes. Feed them to dry cows, but not to them while in milk. In winter the cow gets only dry feed—hay, corn, fodder and straw. It may be some feed meal and bran in small quantity. This is a great change from grass, therefore I think the cow should have something to keep the bowels loose, and turnips will not only do that, but will keep the animal in good health. I do not know that there is so much food in the turnip, so as to save hay or other fodder, but there is something in them that seems to keep the cow in fine condition, and if any one will feed his cows a few messes and look on and see them eat, certainly I think he will say, "Yes, turnips are good food for cows." I am only speaking of dry cows in winter.

Any farmer who grows three to five acres of corn, may have three to five hundred bushels of flat or field turnips to feed if he will take the trouble to save the seed. If any one wishes to try it next season and will follow the directions here given, I will guarantee them a full crop every time:

Get good seed. Sow half a pound per acre in among the corn any time in July when working the corn the last time; be sure and put the seed down broadcast before you plough or cultivate the corn, so as to work the seed into the ground; no matter if you are marking with the plough you will not get them in too deep. The seed will come up sure. For the good of your corn and turnips, keep the weeds down.—*Cor. Rural New Yorker*.

The Fallacy of Pasturing.

A Plea for Soiling.

A great many farmers who do not believe in soiling "because it is too much trouble" will be astonished when they recall the record of the year and see what they have been doing. Nearly every farmer has practiced soiling to a greater or less extent. Many, without intending it or being prepared for it, have had to feed their cattle one, two, three or more months during the growing season. Hundreds of farmers allotted the usual amount of ground for pasture, generally one or two acres per head of horned stock, but scarcity of feed compelled them to begin pasturing early; the dry, cold weather of May put the grass back; the cattle kept everything eaten close, and lucky were they who had a piece of early clover intended for meadow, from which they could cut an armful of grass daily for each cow, to eke out the pasture. This looks very much like soiling; but never mind, we won't call it that, and then nobody will be frightened.

After haying and harvesting there was a temporary improvement. For two weeks cattle filled themselves tolerably well on the upspringing rowen or tender clover. It was costly feed. The farmer might more economically have invited his cows and sheep into the kitchen and given them "table board." Meadows eaten bare and left unprotected for winter—the precious clover, the seed of which costs six dollars a bushel, gnawed to the roots; these

no sorry sights for a farmer who has the good of his land at heart. They show not only a great present loss, but a more important future impoverishment of the soil. And, after all, the cattle didn't get enough. Cows failed in their milk most provokingly, just when butter was steadily going up to forty cents a pound. Judicious farmers fed their cattle—bought meal or mill feed for their cows, and kept their horses in the stable. Lucky was the man who had sown one or two acres of corn fodder or Hungarian grass. The difficulties of curing it for winter use need have no terrors for him; his stock would make a sure and profitable market for it in August and September. If a farmer had not any succulent fodder this season, his cattle must have suffered or been fed hay from the barn.

It is all very well to pasture cattle, provided it can be done according to the programme. Pasturing saves a great deal of trouble (besides making a great deal), but a farmer hardly feels safe trusting to pasturing his stock on the herbage which nature provides, when just as likely as not, nature will knock all his calculations into smithereens by not providing any. No doubt it is more natural for cattle to graze their own herbage rather than have it cut for them. But we are not living in a state of nature. To begin with, there are fences in the way. In a state of nature, when cattle cannot get feed in one section, they migrate to where they can. Fences, the first element of the pasture system, makes this impossible. How is it that sticklers for nature advocate a policy which necessitates cutting the whole country into ten acre lots, with impassible barriers between?

It is wholly a question of expediency, and to be determined by value of land, price of labor, cost of fencing material, and value of manure. This last is an important item. If a farmer needs more fertilizers for his crops, as who does not? soiling cattle rather than pasturing them is the way to increase the manure pile and bring the land into higher condition.

The experience of the past season has shown that whether farmers pasture or not, they cannot safely ignore soiling. Men who believe in laying up for a rainy day, ought also to make some provision for seasons when the rainy days don't come. A piece of drilled corn for fodder will come handy for winter use if not needed before. Most farmers will do well to make a beginning in soiling, keeping their working horses in stable during the summer, and feeding their milch cows something extra whenever the pastures fail. This is always good policy, and nobody need call it soiling unless he chooses. This is always good policy, and nobody need call it soiling unless he chooses. This plan will also utilize all the advantages, such as they are, of pasturing. After the first of September, much of the growth of clover and other succulent grass can be eaten down with little or no damage, provided the ground is dry. By and by, as fencing material becomes more costly, fences will be fewer and fields larger. Wherever land is dear, the space covered by fences, and the weeds they harbor, are important items. The old fashioned Virginia worm fence is a relic of the original wilderness from which our civilization has been born. The improved agriculture to which we are coming demands more labor, and no item will pay better than the time and work needed in soiling cattle. For large sections of the country soiling is, and long will be, impossible; but this is the misfortune rather than the advantage of such regions. They are not the sections which will show the most rapid advance in agricultural improvement. —*Country Gentleman.*

Auxiliary Food for Stock.

The word auxiliary, when used in reference to food for live stock, is a most comprehensive term, embracing, as it does, first of all, a considerable variety of crops grown on the farm, and for the most part highly forced, so as to secure as large a quantity as possible of rich succulent food; thus aiding the pastures and enabling the farmer to keep a heavy stock of animals, and yet have an extensive breadth of corn every year. Under an enlightened and liberal system of husbandry, such crops are not permitted to interfere with the fixed course of cropping carried out on the farm, but are grown wholly during the period which elapses from the clearing of the corn crops in autumn, and the preparatory operations for turnip-sowing in the ensuing spring and early summer. By liberal treatment in the application of stimulating manures, a vigorous growth is induced, and an enormous quantity of food is obtained from land which would otherwise have been fallow. The plants being cut in any case before seeding, the resources of the soil are not in the slightest degree im-

paired, and the standard crop of the rotation which succeeds as the land is cleared is actually benefited if the cultural operations have been carefully attended to. Crops thus grown are strictly supplementary, and are principally used in the house for a morning and evening feed; as, for instance, with dairy stock, in sheds or yards with store cattle, or simply thrown on the pastures, to be consumed by the general stock of the farm. Food used in this way tends largely to forward the interests and material prosperity of the farmer, his animals being improved in condition and amount of produce, his fields are continually top-dressed with substantial manure, and the home supply of the latter becomes after a few years so abundant as in a great measure to preclude the necessity of purchasing bulky manures, the mere saving in the expense of carriage being an item well worth looking after. The latter becomes distinctly noticeable in about five years if auxiliary crops have been extensively and regularly grown, and every known method of fertilising the soil persisted in during that time. It is of course premised that the farmer possesses sufficient capital for the extent of his holding, and that he has the spirit to spend it, and is protected by liberal covenants in so doing, either of these qualifications absent, the most absorbing enthusiasm, combined with the most slavish industry, on his part, will fail to command success. In the catalogue of auxiliary foods available to the farmer, there is also included a large number of feeding substances in a concentrated form, consisting principally of oleaginous cakes, specially manufactured for stock-feeding purposes, immense quantities of the various kinds being imported ready for use, the seeds also being imported and crushed in England. Thus the farmer may purchase Canadian cake, as manufactured in Canada, and shipped to this country ready for distribution to the consumer. East Indian linseed-cake is another well-known designation; this cake not however, as its name might seem to imply, being imported in the form it reaches the farmer, the seeds only coming direct from the country of their growth, and afterwards manufactured in the United States, England, and several other countries. Decorticated cotton-cake, another excellent feeding substance, is solely prepared in New Orleans, and largely imported into Great Britain of late years, while the undecorticated is made in England from American, Egyptian and Indian seeds. The whole of these substances, which at the present day exercise such an all-important influence on the prosperity of cattle-feeders, and which are brought into this country in such immense quantities, very seldom reach the farmer direct from the importer, but mostly through the meal cake and manure merchant, these branches of business being usually combined. The cattle-feeder, though thus taxed with an intermediate profit, is, nevertheless, greatly benefited, as he is enabled to get his cake in quantities to suit his requirements at regular intervals throughout the season, and so have it always fresh, a point of some importance with such an expensive article, as it is highly susceptible of injury by exposure to damp, and in large quantities requires considerable space for storage. Large consumers, who circulate pretty closely to the quantity they will require throughout the season, have it in their power to cut the intermediate profit very low indeed, as the merchant will be only too glad to have the orders of his clients placed early, so that he may secure himself and be able at the proper season to contract with the importer or manufacturer for a full supply by this arrangement all parties are largely benefited—the shipper, the wholesale merchant, and consumer, and all knowing what they are about, can carry on their business with a feeling of confidence and security which no ordinary fluctuation in the value of feeding-stuffs is able to disturb. Of course such a comprehensive arrangement, in which important interests and largesums of money are involved, can only be carried out by the almost unanimous consent of the farmers themselves, all the other parties being simply engaged in supplying their wants, carrying out their instructions, and receiving their cash. As an inducement to give an early estimate of the amount of cake feeders are likely to require, it will be invariably found that the dealer will cut his profit on the transaction down to the lowest possible point at which it is worth while to place the order on his books, contracting for the entire season, and offering every accommodation necessary in the way of storage, and delivery in convenient quantities at stated periods. These remarks are not by any means merely theoretical, but are based on the commercial transactions of no more distant period than the past feeding season, during which time many agriculturists who are large consumers lost considerable sums of money by omitting to contract for a full supply of cake at the commencement of the season, when it was as low in price as could reasonably be expected. In the single instance

of cotton-seed cake, one of the most useful and generally popular feeding stuffs of the present day, a remarkable instance as unexpected took place in the very middle of the season, when it could scarcely either be done without or economised, without excessive inconvenience. The increase in price under the most favourable conditions was one-fourth, rising occasionally to one half, when stocks became low, and from various causes were difficult to replace. The position of those who had the forethought to contract contrasted most favorably with that of others who merely took chance, although their necessities were quite as urgent, as they not only had to pay from 25 to 50 per cent extra for the cake they used, but had actually to wait until those were served who were getting it on much lower terms. The time is now near at hand when cake will be required most probably in very large quantity, to supplement what, even under the most favorable conditions as to weather for the remainder of the growing season, can only be a moderate root-crop, and purchasers, profiting by the experience of the past winter and spring, will do well to make early arrangements for a continuous supply throughout the season, on as moderate terms as the tone of the market for the time being will permit, adding always the cost of carriage, an item the consumer can never get rid of under whatever name it may be disguised. No difficulty need be ever experienced in arranging this highly important business-matter satisfactorily, as in every district respectable merchants, able and willing to carry out their engagements, no matter what turn the markets may take, will be found eager to compete with each other, voluntarily offering a guaranteed article at the lowest possible cash price at which it can be supplied. A continuous supply at a fixed price being thus secured for the season, the extensive feeder is saved a vast amount of inconvenience and pecuniary loss.—*Mark Lane Press.*

Long-legged Horses.

For most every day purposes short-legged horses are in general preferred, because in themselves they indicate superior strength, and because by nature they are associated with depth of chest and carcass, and other signs of stamina and durability; but the long leg possesses advantages in stride and leverage, and therefore, where speed is required, becomes a desirable formation. The length of limb must very much depend on the purpose the animal is destined for, a long leg would be as ill adapted for a cart-horse as a short one would be for a racer. To get over the ground length becomes absolutely necessary in the propelling parts of the machine, and these are the loins and the limbs. Occasionally we meet with horses with long limbs and short bodies; but such are rare and undesirable conformations—the limbs doing too much for the body, or rather the latter restricting them in their action.

People in general make objection to horses with undue length of limb; such a horse has "too much daylight underneath him to be good for anything," is a common expression enough in these cases; and *prima facie*—and in many cases, perhaps, out of ten—these people are correct in their disapprobation. But every now and then comes a horse before us with all this apparent objectionable sub-corporeal "daylight," and yet with extraordinary power in his long limbs, with circularity in his chest, though it be not deep, and with the known character of being "a good feeder after work," and when such a horse does present himself, we may, should he possess breeding, regard him, notwithstanding his long legs and light body, as an animal of a rare and valuable description. His legs having but little to carry, are therefore likely to "wear well," and he is likely to prove a fleet horse, and withal a good-winded horse—one that is likely to turn out a most valuable acquisition. One ought not hastily to reject a horse with long limbs and their ordinary accompaniment, a light carcass.—*Pacific Farmer.*

Care of Stock.

Every animal on the farm which is now thin in flesh will have a hard time of it this winter, unless it receives extraordinary care and attention. Somehow nature has provided that all healthy animals shall be fat in the fall, as a condition for passing the rigors of winter comfortably, or even safely, and coming out healthy, sound and vigorous in the spring. There is no compromise in nature's laws, and if they are violated or deflected from the penalty must be paid—"without defalcation or discount." The breeder who would thrive by his occupation must conform

his practice to these simple laws. It is not pretended, of course, that a lean animal, which is so not because it is really unhealthy, may not be fattened or brought into good condition during the winter months, but that it costs too much to do it, that it is bad economy, and that the necessity for it ought to be avoided and will be avoided by every good farmer in all cases. There is no better evidence possible that a farmer is running down hill and will sooner or later reach the bottom than to see his stock, whether horses, cattle, sheep, hogs or chickens, poor and weak in November. They will be poorer and weaker and so will his purse, before next May, while some of them will have gone beyond the reach of inhumanity and starvation. If any reader has any stock in this fix let it be taken care of at once; if not able to do it just now, let it be sold at once, if it can be, to some one who is, if it will bring anything, and if not let it be put "out of its misery." Don't wait, for the longer you delay the more it will cost. It is cheaper to put on flesh in November than it is in December or January, and every week's delay entails unnecessary loss.—*Prairie Farmer.*

At a Massachusetts fair a dairy herd of nineteen cows was shown, sixteen of them being descended from one shown, now nineteen years old.

The *Daver Agriculturist* says:—"Those parties who have tried the Hereford cattle in Colorado are much pleased with them.

PROF. HUNT says that "Perennial grasses are the true basis of agriculture in its highest condition." It has been often said that grass is only another name for beef, mutton, bread and clothing.

The *Mark Lane Express* informs us "that the Devon tenant farmers are stealing a cross from the Short-horn in their native herds, much to their satisfaction, too." It also adds, "For increased size, with elegant grace and aristocratic style, let them try a small red bull of the best descended Bates or Knightly tribes."

FUNNY DESCRIPTION OF A HORSE.—About the year 1451, Julian Berners, sister of Richard, Lord Berners, wrote three English tracts on hunting, hawking and heraldry. From an edition of this book, printed by Wynken de Worde, in 1495, we take the following extracts:

"The proprieties of a good horse: A good horse shoulde have fifteen good proprieties and condicions; that is, to wyte, three of a man, three of a woman, three of a fove, three of a haare, and three of an asse. Of a man, boled, prowde and hardy; of a woman, fayre breasted, fayre of heere, and easy to move; of a fove, a fayre taylle, short ceres, with a good trotte; of a haare, a grete eye, a dry heed, and well rennyng; of an asse, a byggo chynn, a flat legge, and a good hoot."—*Merry England, its Sports and Pastimes.* By Lord W. Lennox.

The St. Lawrence county dairymen have been discussing the length of time a dairy cow should go dry. After two hours debate a vote was taken, which resulted in a six weeks' vacation for each dairy cow, beginning with the first of January each year. The cows may protest against being granted a vacation at a time when all their friends are fastened in the stanchions, the amusements of bovine society of little interest, and the festal board covered with corn stalks and raw beets. Doubtless if the cows should have a two hours' talk, they would approve Secretary Morrow's plan of devoting their attention to family matters in the fall, and having a six weeks' vacation in the summer when the town fairs are in blossom and the circus is abroad in the land.

ENGLISH IDEAS of the value of Indian corn are advancing rapidly as may be inferred from the following from the *Mark Lane Express*: "Maize is getting into extensive consumption for feeding cattle. The price was for a long time below its actual value for feeding purposes, but the graziers have discovered its valuable properties, and maize is no longer neglected on the market at 28s. or 29s. per quarter. We have an idea, too, that the millers have found that they can use a portion of it, especially of the white corn, without any material injury to the flour. Be this as it may, the demand for maize increases, and the price has risen to 38s. per quarter for the white and 36s. for yellow. In America the darker is preferred for domestic purposes in which, in various ways, it is largely consumed by families. The amount imported during the first nine months of the year 1873 was 15,030,534 cwt., against 15,454,792 cwt. in the same period of the present year, being an increase of 424,253 cwt.

Entomological Department.

On Aphides.

It is difficult for the rose cultivator to look with any degree of interest at the swarm of green plant-lice which sometimes infests his choicest specimens, or for the farmer to contemplate placidly the black pests which are destroying his bean crop; but the life-history of these creatures is so curious and so replete with interest, that the mere naturalist may be excused if he sees in them something to admire. I have no doubt more than one species of aphid is more than sufficiently well known in appearance to all my readers, but I doubt if we have all taken our revenge so fully as we might have done by making them reveal the secrets of their wonderful economy to us in return for the damage they have done to our floral pets.

The aphid, or plant louse, belongs to the order *Homoptera*, and the genus is a very large one, numbering, I believe, some 320 species, almost every one of which requires its own peculiar plant to supply it with nourishment. The species with which we are most familiar are those found in the rose, bean, hop, and fruit trees. The damage done by the hop-ly, as it is called, is sometimes very great, affecting the duty to the extent of many thousands of pounds. Other species cover the stems of plants, or infest the under surface of the leaves, causing them to form hollow cavities of a red color, in which they find a perfect shelter. Their mode of feeding is to draw up the sap through the rostrum, and thus, by diminishing the vigor of the plant, they produce deformity and injury to the fruit or flowers. It is said that they do not attack plants in perfect health, and thus I believe to be the case generally, but whether it always holds good I cannot say; certain it is that any circumstance (drought, easterly winds, &c.) which checks the vigor of the plant is favorable to the attacks of the aphid. I have also noticed that an improvement in the health of the plant is attended by a corresponding decrease in the aphides, and that they will again multiply should the plant exhibit fresh signs of sickness. The suddenness with which they make their appearance, and the vast numbers acquired in a very brief period, are wonderful; the plants in a whole field of beans will appear to be covered in a few days; but this will be less astonishing when we consider the mode of reproduction and the rapidity with which it takes place. Sexual intercourse takes place only in the autumn, after the insects have become fully developed; the female then deposits her eggs in some secure spot, where they remain dormant through the winter, the first genial days in spring bringing forth, not the perfect winged form which produced the egg, but the well known wingless form which is so familiar to us all.

This wonderful fertile larval form is possessed of great fecundity, but it is its mode of reproducing which is so remarkable; this is carried on by internal gemination, the young one being produced alive, and differing from its parent only in size. The process of development goes on for several generations without any change in the form of the insect; at the close of the summer, however, the fertile forms which have not reproduced themselves pass, by metamorphosis, into the winged insects, males and females, for the most part winged. These, after pairing, produce the eggs which are to be hatched in the ensuing spring, after which they die. During the summer months numbers complete their metamorphosis, and appear as winged insects.

The larval form which will undergo the final metamorphosis may easily be recognized, the bulbs in which the wings are enclosed being visible on either side of the thorax. I have separated many of these, and placed them under a glass shade, but in no instance have they reproduced, the development continuing until, after the final shedding of the skin, they have appeared as fully developed winged insects. They have never produced eggs, and I think were all males; it seems probable that although winged insects are produced during the summer, it is not till the autumn that the perfect females are produced; all the fertile larval females which I have kept, either alone or under the same shade with the winged form just mentioned, have increased rapidly in the usual way, and in no instance produced eggs. The perfect insect is very different from the larval form, and, under the magnifying glass, is a very handsome object, with six long legs, graceful antennæ, shining wings, and spotted sides, also a pair of curious projecting tubes, standing out like horns, near the extremity of the abdomen, of which more hereafter. This intermediate but fertile form of the aphid is an example of the nursing system of Steenstrup, ob-

served also in the vegetable kingdom in the case of the ferns and horse-tails which increase by spores, which, falling into the ground, produce the prothallium.

The prothallium never becomes a fern, but on it are formed the true generative organs which produce the embryo afterwards developed into the perfect plant. This case differs from the aphid in the nurse-form, the prothallium producing the generative organs.

The echinoderms, &c., exemplify other variations of the same phenomena. Mungo Ponton thus describes the fertile nurse-form and the way in which it is illustrated by the aphid:—"By fertile nurse-form is to be understood an organism which becomes fertile without ever attaining, or at least before having obtained, the perfect form due to its species. . . . In simple metamorphosis, it is one and the same individual organism that passes through all the stages, from the form which it wears on leaving the egg to that which it assumes on attaining the perfection belonging to its species; but in the case of a fertile nurse-form, it is in general only those forms which are produced by the nurse that ever attain the specific type. So, likewise, in simple concurrent reproduction, it is one and the same organism that exerts both the power of individual multiplication and the faculty of sexual generation; whereas, in the case of fertile nurse-forms, it is seldom that they possess both; but if the nurse be endowed with the one, its offspring will be endowed with the other." ("The Beginning: its When and its How," pp. 242, 243.) It sometimes occurs that the nurse acquires the power of sexual generation, also that the species passes through more than one nurse-form, either similar or diverse, before attaining the perfect form of the species. In the aphid is found one of the most decided examples of the fertile nurse-form (and one which it is very easy to study), the immature females standing in that relation to the perfect insect.

These fertile females, as has been said before, reproduce by internal gemination, the bud falling into a proper receptacle in the parent's body, and being produced alive, exactly like its parent except in size; each female producing from 50 to 100 young ones. So rapidly do they increase, that it has been calculated that from one individual there might be descended, under favorable circumstances, the enormous number of 4,000 billions in a single summer.

Were it not for its many enemies, the increase of the aphides would be beyond all bounds; but, fortunately for us, its enemies are very numerous. Birds consume great numbers, but the larvæ of the ladybird, feeding exclusively on the aphides, destroy them wholesale, extracting all the soft parts, and leaving the empty skins to testify to their enormous appetites. The larvæ of the beautiful lace-wing fly destroys great numbers, as does also that of the various species of syrphidae. In July 1869, we were visited by a great plague of aphides, and all the three species I have named speedily made their appearance also in great numbers. The ladybirds swarmed in countless numbers, and immense numbers of their unsightly larvæ soon appeared. The rapidity with which these larvæ cleared the aphides from a hothouse in my garden was truly astonishing. The clusters of curious pedunculated eggs produced by the lace-wing fly were numerous, as were the perfect insects, than which nothing can be imagined more delicate or beautiful or a greater contrast to its larvæ, which, from its voracity, has been named the aphid lion.

Another foe is a small species of ichneumon which deposits its eggs in the body of the aphid, the larvæ feeding upon its soft parts. The brown and swollen skins of the insects thus infested may frequently be seen, and, if placed by themselves in a glass-topped box, the active little ichneumons will soon burst through their prison, and reveal the secret of the death of the unfortunate aphides.

There is another curious chapter in the history of the aphid which is worthy of notice. It is the unfair treatment which it receives at the hands, or antennæ, of the ants. Linnaeus calls the aphid the ants' "cow," and the use to which this sagacious little insect subjects it fully justifies the term. The aphides eject from the two tubes before mentioned as situated one on either side of the abdomen, a quantity of saccharine fluid, which is very attractive to the ants, and forms in some cases almost their only food. This fluid may be noticed overspreading the leaves of plants infested by these insects till they have a glazed appearance, and seem to have been washed with honey and water. It is commonly called "honey-dew," and was long a puzzle as to its origin. Not only do the ants consume the fluid voluntarily ejected by the aphides, but by a peculiar movement of their antennæ upon the bodies of their "cows," excite them to an increased supply. This has not inaptly been called "milking." But even this is not all, Kirby and

Spence give a most wonderful account of the way in which some species of ants, particularly the yellow ant (*P. flava*), convey the aphides to their nests, and keep them there for the supply of their necessities. The yellow ant makes prisoners of root-feeding species of aphids (*A. radicum*), and even carries off its eggs, which are tended with care and placed in situations favorable for their early development.

I think it will be allowed that whether we consider the aphid as a marked example of the wonderful "nurse-form," as described by Steenstrup in his "Alternation of Generations," and one accessible for study to us all, or whether we confine our attention to its life-history and the singular connexion between it and the ant, to which it is so servicable, there is ample scope for observation, and that too of a character, from the delicacy and exactness required in its pursuit, which must of necessity be good training, should it even only extend to verifying the observations of others on this interesting but generally unwelcome little creature.—*Science Gossip.*

Burying Beetles.

There are many of the carrion-eaters which are strong-toothed, and can eat almost any animal substance that is less hard than bone, but those of the burying beetles cannot do so, and must have their food kept soft for them. For this purpose there is nothing better than burying it in the ground, where it cannot be dried up by the hot sunbeams or liquified by the wet, and absorbed into the ground before the grubs have lived their full larval life. That wonderful substance, earth, is the best preservative that could be found. The body of an animal, if covered with only a few inches of earth, decays but very slowly, and preserves its softness and moistness to the last. Of this property the beetles in question are taught by their instinct to avail themselves, and, inadequate as their bodies may seem to be for such a task, they manage to bury beneath the surface of the ground any small animal that may be lying dead upon it. This they do, not by digging a hole and putting the animal into it, but by scooping away the earth from beneath it, and so letting it gradually sink down. Even in our own country, where land is extensively cultivated, and where in consequence comparatively few carcasses are allowed to lie unburied, the burying beetles are very numerous, and their work is really valuable. It is chiefly owing to their labors that a dead bird, mouse, rat, or any similar creature, is so seldom seen. In the first place, all wild creatures, on feeling the approach of death, seek out some retired spot where to breathe their last; and, in the second place, their bodies are mostly found and interred by the burying beetles before they become offensive to the nostrils. The sensitive organs of these insects detect decaying animal matter at wonderful distances, so that if a dead bird be laid on the ground and left undisturbed, it is mostly beneath the surface in four or five days. When collecting these beetles for the purpose of dissecting them throughout their various stages of existence, and watching the development of the various organs, I used to take dead birds, mice, rats, or even pieces of butchers' offal, and hide them away in fields, taking care to place them on soft ground, and always covering them with a flat stone so as to prevent them from being seen. The stone was no impediment to the beetles, who are directed by their olfactory and not their visual organs, and in the course of a single summer I thus obtained as many specimens as were needed. Abroad, however, and especially in those vast tracts of land which have never been subjected to man, the burying beetles are, as might be supposed, larger, more powerful, and more numerous than they are with us, and perform good service in placing beneath the ground those dead animals which would otherwise be allowed to decay upon its surface. Thus they are not only scavengers, but agriculturists, for they enrich the soil by burying beneath its surface those substances which would only be wasted if allowed to decay above ground.—"*Insects Abroad*," by the Rev. J. G. Wood.

PRESERVING SPECIMEN INSECTS.—M. Anzoux states, for the benefit of those who are engaged in collecting insects, that he has discovered a new method of rapidly killing and preserving for a considerable period without harm, specimens collected in expeditions. He recommended a few drops of essence of bitter almonds to be placed in some sawdust, which should itself be enclosed in a flask hermetically sealed. M. Anzoux has received from the Isle of Ceylon flasks thus prepared containing insects still so flexible as to permit of their being prepared and mounted, though they had been collected at Point-de-Galle some months previously.

Miscellaneous.

Farmers as Business Men.

We clip the following suggestive article from *The Utica Herald*:

There is scarcely a quality of skill, shrewdness and activity which gives success to the merchant and the manufacturer but could be profitably employed upon the farm. How much skill in purchasing the business demands. A merchant may be deceived in a purchase, and the material may be a loss upon his shelves. But the farmer's success lies in production, and how a mistake at the outset multiplies and propagates itself in the process of reproduction. A poor farm tool may not only consume the time necessary to replace it, but hazard a crop by its failure at a certain moment. And where is there more delicate and more skilful business than selecting an animal which shall influence the form and qualities of all the younger stock. These are all operations in which a farmer is called upon to act wisely and exercise purchasing skill. But there are other dangers.

Who that has seen twenty bright copper wires extending a perpetual invitation to the passing cloud fire to strike the single sheep shed upon which the lightning-rod man has fastened them, thinks that there is no occasion for purchasing skill upon the farm? Who that has watched the credulous farmer as the costly wire was driven down, yard after yard, into the soft sand beside his dwelling, so that the lightning would be sure to be carried below the foundation, but has thought that the farmer might not be a better buyer.

But it is not in buying alone that a farmer may profitably employ commercial skill. He is more a seller than a buyer. His success depends upon having something to sell and selling at the right time. What can there be more skilful than producing the best paying crop every time, what can there be more skilful than selling at the right time every year? Perhaps there are few farmers who do these things, but they are within the capacities of his business, and now as every industry among men is becoming more systematized and its results becoming more the fruits of accurate calculation and intelligent foresight these capacities must be discovered and developed. The farmer can be a better business man. A youth need not go to a store to struggle with commercial problems. They are lying all about him on the farm. If he can not perceive them it is partly his own fault, partly his father's.

One direction in which success in business is attained is by the full enlistment of heart, strength and intellect. The result is a constant activity of brain and hand, and a constant application of interest. The successful merchant buys well and sells well. He does not change the form nor materials of his merchandise. He does two things which call for skill, buying and selling, and yet how wide-awake and active he is. How he stirs the community with his bustle and tumult. How interested he becomes in his calling. How he labors to increase his traffic. He throws his energy, his wisdom, his life, into his store and succeeds.

The manufacturer performs three skilful acts. He buys, he changes the form of the material, and sells. He loads the inventor with fruits of his invention, he pours upon the counters of the shopkeeper the product which makes him rich in handling it. He seeks far and wide for cheaper raw material; he draws from laboratories the latest scientific discoveries and from skilled mechanics the newest inventions and he seizes every method for impressing people with the use and value of his product. He is in the doing of his three skilful acts, is ever active. The clatter of his machinery shakes up the clay about his establishment into cottages, and people come to live in them. He gives a new town to the map, a station to a passing railway and he builds a mansion on a hill top overlooking the busy village which he may be said to have almost created. These, in brief, are the arts of the merchant and the manufacturer and these the ends for which they labor. They are full of life, of nerve and of excitement.

The farm does not require the same activity and tumult but it does reward the same kind of fullness of interest and earnest progress when they are practically and intelligently brought to bear upon its operations.

Many a young man goes out into the world to make a fortune because he regards the profits of the farm as fixed and incapable of much increase. Out in the world there are investments which return large percentages; on the farm there is nothing to do but to plant and to hoe and to draw to market what the

soil sees fit to produce. Out in the world there seems every opportunity for shrewdness, for commercial skill, for financial wisdom and foresight; on the farm all the farmer's commercial ability is thought by some people to consist in selling a crop as soon as threshed or in holding it until it sells at a sacrifice.

Farmers encourage this idea too often by their unwise actions, and yet if we look at the farm business, its opportunities for promising business risks, its percentages returned for investment in timely production, its call for the most careful purchase and sale of commodities, it will be difficult to find another of the ordinary occupations of men who can more profitably employ the best commercial ability.

Waste Not, Want Not.

The whole body of agriculturists complain badly, and tell everybody that "farming don't pay," and it is a fact that very few men engaged in farming grow enough to pay expenses. The cause of this is the selling of the crops of grain, corn and hay from the farms, or the waste of the manure resulting from the use of much of this produce. Meat, eggs, vegetables and breadstuffs are all consumed by mankind, and the resulting faecal matter, which is of the most fertilizing quality, is generally all washed into sewers and through these places into the waters near cities or towns. Thus vast quantities of valuable plant food are wasted while the land needs it so badly that it becomes almost sterile from want of it. Waste thus produces want, and governments of countries are poor, useless bodies or they would devise some means of preventing this shameful waste. A gentleman was telling me a few days since that a friend of his had just returned from a sojourn in Japan and China, where the husbanding of manual resources is an example to the rest of the world; there is positively no waste there, and yet all is managed in a decent and simply inexpensive way. Here in America are men professing to be progressive, and there are plenty more in England claiming great genius and inventive powers; yet in both countries Peruvian guano and other costly fertilizers are being bought, while the strongest and most lasting of all stimulants is washed away where it is worse than worthless. Chemists make great boasts; yet they have devised no means of rendering all the night soil of cities and towns inodorous. The Chinese, who are laughed at by the Europeans and Americans, save everything of the kind, and their soil supports a population much denser than the English, without any importation of manures. A government that cannot devise means of preventing such vast waste ought to be impeached and punished for imbecility, and none out of ten of the chemists deserve severe punishment, for their labors are chiefly directed to adulteration of expensive drugs, and keeping up to a ridiculously high price every simple article that comes into the list of a drug store.

There is a society for the prevention of cruelty to animals, and there ought to be one for the prevention of barbarous treatment of the land; for there are thousands of farms actually starving, and being brought to such a state of destitution that life is almost extinct, yet food for this famished soil is wasted and thrown into places where it does harm instead of good. The welfare of the country, the goodwill due to posterity, and the duty of the children of the present generation, all should influence the rulers of a nation to have laws to fine and punish those who rob the soil of its natural fertility to enrich themselves, at the expense of their descendants and to the loss of the future income of the country. People do not look at many subjects in a proper light. When I was a child it was considered wicked to waste bread, or any good food; it was, in fact, a part of religion to be careful of what was said to be given by the Almighty for the use of man, and, though this was in Old England, yet the same ideas were entertained by the descendants of the Pilgrims. And New England is to the present moment thoroughly economical, and much of the best cooking and preserving for winter use, &c., originated in those Eastern States; yet in these very States the soil has been impoverished to as great an extent as any part of the first settlement upon the Atlantic, and with all the industry which they are well known to possess, and with self-denial, and work in extra hours, making their life almost slavish in constant toiling, they cannot do more than pay their way and keep out of debt, for they cannot grow any wheat to pay for cultivation. Their mountain land, which formerly used to graze cattle and sheep in good numbers, will not now keep in good condition half as many, because they have foolishly discontinued keeping sheep in numbers sufficient to keep a thick

set of bottom herbage; and like the rest of the monomaniacal agriculturalists, they think there is but one grass worth preservation, and that is timothy, and as grazing that grass close does not suit it, every other consideration has to be thrown on one side. For the sake of one mowing the waste of the rest of the herbage takes place, and here want follows waste as surely as it does elsewhere.

Waste not, want not! but it is waste everywhere, not only the waste of manure in every shape, but half the seasons are wasted, for where grain is grown without seeding to grass, the months of August, September and October are wasted, or I should say, the land is wasted during those months, and July should be mentioned too, for wheat is often harvested at the beginning of July, when a good renovating crop might be sown. Instead, the weeds grow up, go to seed, and look disgracefully untidy; and in the very months in which in England and Scotland millions of acres of roots grow and enrich the soil by the manure made from feeding them off with sheep, the land runs to waste, and want of manure is felt everywhere after the first flush of plant food in the virgin soil has been exhausted by continued cropping. A great deal of waste drudgery is self-imposed; for there is in America a kind of superstitious faith that every one ought to be compelled to use their muscles and strength of body, and that it is the duty of every one to labor hard with their bodily power, as if it was a sin to use the mind to save the body, and also as if no one has a right to pass through the world and waste the work that is in him.—*George Gables.*

Are Our Farms Deteriorating?

This question has come up to my mind many times during the last few years as I visit the various sections of the country, and converse with the farmers from the different parts of our broad land. Sometimes I fear it is true; for it is a fact, humiliating though it may be, that some of our principal crops are becoming more uncertain each year. Especially is this the case with the corn crop, which was once our most certain crop, but now, unless the land is in a remarkable degree adapted to the crop, failure is as likely to follow as success, in the style in which we cultivate our lands. The yield per acre of corn diminishes in a somewhat alarming degree, notwithstanding our other crops are as good and often better than formerly. It may be owing to the change in the seasons, for let the meteorologists say what they please, we do have colder nights and more varied weather during the growing season. This is abundantly proved by the oat crop, which is far better than it was ten or fifteen years ago. While talking with an old farmer recently, one who has grown grey in the ranks, a man of ability and good judgment, he remarked that "in some respects this country is worn out, and a young man had better seek another to begin life in," for, said he, "our seasons are becoming more capricious every year, and although we raise bigger crops of hay, and perhaps of oats, still, as a rule, good crops cannot be depended upon from many of our farms, do what we will. All land is held at the price of good land, whether it is good or bad. If one man sells his farm at \$50 per acre, his neighbor must have as much or he will not sell; consequently many have bought farms who cannot make them pay, and are discouraged, when if they could have bought good land, they would have made good farmers."

In my opinion, our lands as a general rule are in a great measure exhausted of some of the necessary elements required to produce good grain, corn especially, and how to replace them must be our study for some time to come. I fear our farm-yards do not furnish a quantity of manure sufficient to any more than maintain our present losses. What the past has taken away must be replaced in some other manner. Not only do our yards fail to give us enough manure to improve our farms as they ought to be, but it is every year becoming more unprofitable to feed any stock except that from which we can realize a daily revenue, or in other words, milch cows or mutton sheep. Many farms are not adapted to the dairy business, and more farmers cannot, from various causes, keep dairies. Sheep, owing to the limited demand for early lambs, and low price of wool, will not be kept by any great proportion of our farmers, so after all the problem remains unsolved, unless we can make it profitable to purchase artificial manures, and grow a larger amount of forage on the same area. Then by feeding this to stock even at a loss some years, we get our profits from increased grain crops and general improvement of our lands, thereby enabling us to keep a greater

number of cattle and sheep without any additional cost for land. This seems to be the best plan, if not the only one practicable for us to pursue. The only difficulty is the question where we shall obtain the capital necessary to carry out this series of improvements. Indeed the more we meditate upon this all-important subject, the more insurmountable appear the obstacles in our path. In the end we must have better prices for our produce, or cheaper capital to work with, or else see our lands slowly but surely fail, and be powerless to prevent it.—*Cor. C. Gent.*

The Young Man who "Sticks to it."

There is a great deal of regret expressed in speeches, letters to agricultural papers, and in editorials by kind-hearted, well intentioned editors that the boys are leaving the farms. There is no doubt that many young men have realized the fact that farm life is no "harder" than city life. There are many who have been wise enough to return to the farm after testing the realities of life in a city. But the boys who leave the farm for the city or the village follow the example of older men. The number of well-to-do farmers who have realized beautiful homes, reached middle age and have sold their farms, bought village or city lots, and settled on them with a view to "taking things easier," is not a small one. These men do so with the same, or similar, motives with which young men leave the farms, and they are as often disappointed in the results.

We know farmers, both young and old, who have abandoned profitable and beautiful farm homesteads, removed to the village, invested their capital in trade, got pretty thoroughly "cleaned out" in a business in which they had no practical experience, and have bought back their homesteads at an advanced price, running in debt to get possession of them, and working hard and contentedly to pay again for what they once possessed. Some of these men have said to us, within the past two months, "A farmer is a fool who sells his farm thinking to have an easier and happier time in a village or city."

The effect of such reaction in the case of these examples up to those who stick to the farm is exceedingly wholesome. It renders them more content. They have not wasted their substance in "pulling up stakes" and removing from "the old landmarks." They have been steadily accumulating as farmers and gathering about their homesteads all the modern appliances for the conservation of comfort and content. The young (or old) farmer who "sticks to it" is sure to win what city-made money rarely purchases— independence, happiness and a sense of security which is the result of well-doing.—*Moore's Rural New Yorker.*

The Work of Insects

The following calculations show the immense value of tiny insects and insignificant looking worms:

Great Britain pays annually \$1,000,000 for dried bodies of the insect known as the cochineal; while another, peculiar to India—gum chellal, or rather its production—is scarcely less valuable. More than 1,500,000 human beings derive their sole support from the culture and manufacture of the fibres spun by the silk worm, of which the annual circulating medium is about \$200,000,000. In England alone, to say nothing of the other parts of Europe, \$500,000 are spent every year in the purchase of foreign honey, while the value of that which is native is not mentioned; and this does not include the 10,000 pounds of wax imported annually. Besides, there are the nut galls, used in making ink; the cantharides or Spanish fly, used in medicine. In fact, nearly every insect known contributes in some way to swell commercial profits. Even the dreaded Colorado potato bug may become useful, as will be seen from the following note, which we clip from an exchange: "An order just received from a chemical manufactory firm of Indianapolis for one thousand pounds of potato bugs may be classed as one of the curiosities of commerce. It has been discovered that these insects possess qualities which make a good substitute for the Spanish fly, and there is a prospect that, from being regarded as an unmitigated pest, they may become a source of actual profit."

Oil-cloth is ruined by the application of lye-soap, as the lye eats the cloth, and after being washed it should be wiped perfectly dry, or the dampness will soon rot it. If laid down where the sun will shine on it much, it will be apt to stick fast to the floor, unless paper is laid under it.

In Sweden gardening forms a part of the educational system. Upwards of 2,000 schools have gardens for planting attached to them, and the teachers of elementary schools are obliged to learn gardening. There is a garden attached to the Higher Bingham School at Utrecht, in which botanical specimens are planted, arranged, and classified by the pupils. To some extent, gardens have been apportioned to schoolboys in this country, but rather as a means of recreation than of study. The Duke of Northumberland's School, at Alhwick, affords an instance in point. But it is worthy of much wider adoption in country districts.

WORKING HARD.—Working hard is not always working to the best advantage. A man may work very hard chopping cordwood with a dull axe, and pumping water with a pump that "sucks air," but he is not working with economy. A man gets pay, or ought to get it, not for working, but for what he accomplishes. This is as true of the farmer or hired man, though we do not feel its force so fully in the one case as in the other. We do not like paying a man for carrying one pail of water when he might just as well carry two, or for ploughing or harrowing with one horse when he might just as well drive three. But farmers themselves often do things equally wasteful of time and labor. Do they never take a load to the town and come back empty, and then go empty to the town to bring a load back, and thus lose half their own time and that of the team.

AMOUNT OF WATER CONTAINED IN DIFFERENT PARTS OF A PLANT.—M. Galeznoff gave the result of his researches in calculating the amount of water contained in the different parts of a plant. By dividing a trunk into a number of pieces from the base upwards, he found invariably that the quantity of water increases from the base towards the summit. Of the four species studied by him, he found *Pinus sylvestris* contained most moisture in the trunk, and *Acer* the least. *Betula* and *Populus tremula*, were intermediate. In *Pinus* the bark is drier than the wood, and in *Acer* more moist. In *Betula* it is drier in the winter and spring, and more watery in summer and autumn. The contrary takes place in the case of the poplar. In the branches the same law holds good, but their bases are drier than the portion of the trunk from which they take their rise; and the petioles are more watery than the leaves. In the flowers, the perianth, the filaments and the styles contain more water than the anthers.—*Journal of Botany.*

ENGLISH SPARROWS NOT A NUISANCE.—It has been reported in some quarters that the English sparrows imported into the Eastern cities were proving a by no means desirable accession to our bird population. They are accused of pugnacity and mischievousness, to such an extent as to disgust the better-mannered native-birds who were said to desert the neighborhood of the sparrows. The *German Town Telegraph* says this is all rubbish: "We were among the first to have the European sparrow upon our premises, and they are now quite numerous; but up to the present time they have nothing to do with driving other birds away. The robins were more numerous the past season than usual. So were the catbirds; the common sparrows were here as usual; the kingbirds ditto; the wrens ditto; the wood robins ditto. We have no bluebirds—a very shy, silent bird, because the wrens drive them away; they throw their eggs out of their nests and take possession, and then build up the entrance so completely that nothing larger than a wren can enter. The winter sparrows from the north come here as usual, and they and the European sparrows get along harmoniously, taking their feed together."

THE MOSQUITO.—In its perfect or winged state it is about as annoying a creature as can be, but then it must be remembered that the traveller is but a casual intruder in the natural domain of the mosquito, and must expect the consequences of his intrusion. Devouring travellers is not the normal occupation of the mosquito, for hundreds of successive generations may live and die, and not one of them ever see a human being. Their real object is a beneficent one. In their larval state they live in the water, and feed upon the tiny particles of decaying matter that are too small to be appreciated by the larger aquatic beings, and, by devouring them, purify the water and convert death into life. Even in our ponds at home, we are much indebted to the gnat larva for saving us from miasma; while the vast armies of mosquito larva that swarm along the edges of tropical lakes and feed upon the decaying substances that fall from the herbage of the banks, purify at the same time the water and the atmosphere, and enable human beings to breathe with safety the air in which without their aid no animal higher than a reptile could have existed.—*"Insects Abroad," by the Rev. J. G. Wood.*

CATS FOR RATS.—The best remedy we have tried for rats, is cats. I had rather keep half a dozen cats than that number of rats. Once we thought we could not endure a cat on the premises, but when the rats ran everywhere—through the buildings, into the garden, chicken and gosling coops, and would face a person with such an insulting look—we caved in. We keep three (one is eight years old), the year through; at times there are more. What we cannot give away we allow a free ride when old enough to take care of themselves. A cat should not be fed any meat; give plenty of milk, some potatoes, crumbs of bread, etc. Rats, for the past ten years, have been few and far between; the cats stand as sentinels, and take them soon after making their appearance on the farm.
Cor. New York Tribune.

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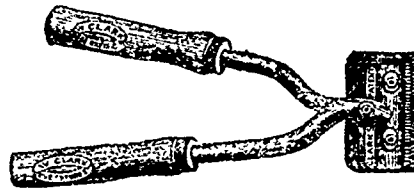
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