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THE CANADA FARMER

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The Field.

Water on the Farm.

Happy is the man whose estate is well-watered. In ancient times and oriental countries, it was considered a rare piece of good fortune to be "planted by rivers of water," and "a land whose springs fail not," was regarded as especially favored of heaven. All right thinking people will entertain very much the same views in these days. The value of a farm, other things being equal, is greatly enhanced by its having an abundant and unfailing water supply, as compared with one that is deficient in this respect.

Ours is, for the most part, a well watered country, but there are times, both in summer and winter, when owing to drought, the springs fail, the wells go dry, and the very swamps are devoid of moisture. In these circumstances, great inconvenience is caused both to man and beast The stock must be taken long distances to living streams this can only be done occasionally, say once a day—and the animals are part of the time annoyed by thirst, and the rest of it gorged with excess of drink. Owing to thoughtlessness and ignorance, there is much suffering inflicted on the brute creation for want of water; and the "Society for the Prevention of Cruelty to Animals," lately formed in this Province, might very legitimately pursue its enquiries in this direction, and find benevolent work in the country as well as in the city. In order to the highest comfort and well-being of farm animals, they should have constant access to pure, fresh water. Only those that are stinted will ever suffer from drinking too much, for instinct in the brute is a more trustworthy guide than reason in man. An animal with food and drink always at hand, will never take too much of either, except when suddenly turned into rich pasture, or accidentally allowed unrestrained access to grain.

It is astonishing how little some farmers improve the natural advantages they have on their lands. One man has a springy place on his farm which makes a large area so moist that only coarse grass or weeds will grow on it, but is quite useless for watering purposes, when, if he would dig a small reservoir, and a short ditch, he might at once provide a capital watering-place, and reclaim a rich piece of g[illegible]nd. Another has a little trickling rill, choked with l[illegible]sh and rubbish, that nowhere gives a creature the chance of drinking, but which cleaned out and dammed up here and there, would make any number of good watering-places. A third has a nice creek running through his place, but when the land was cleared, old logs and brush were allowed to accumulate in it, and the water is injured by a mass of decaying vegetable matter which it holds in solution, while cattle and horses can hardly get a drink without danger of injury to their legs. A fourth has neither spring nor stream on [illegible]arm, and the supply of well-water is limited, [illegible]pt to fail; but he has low-lying places, here an[illegible]e, where wells could be sunk at small cost—at [illegible] cost, indeed—than is involved in taking stock t[illegible] a distance during a single season, when the home supply fails. Only last summer, we met a farmer on horseback with a drove of horses and cattle going a full mile to a river, when he had in his lane a low place, where water could be got in abundance by digging five or six feet. This man was an intelligent, prosperous farmer, living in a fine stone house, and owning one of the best farms in the region.

A very bad practice prevails in winter time. We refer to watering at ponds or streams that are frozen over, necessitating holes being made in the ice, at which animals are expected to quench their thirst. It is very difficult, even when there is snow enough to give a firm foothold on the ice, for a quadruped to get its mouth down to the water and obtain a drink. What efforts are sometimes made by sprawling out the legs, and bending them unnaturally to get the desired liquid! How often the uncomfortableness of the posture, and the dread of falling, compels the poor creature to content itself with two or three little sips, when its thirst is extreme. Sometimes animals are driven on bare and slippery ice, where they can hardly maintain a footing at all, and expected to drink; when, at the first stoop, their legs slip from under them. When the ice is thick, and uncovered with snow, it is often impossible for stock to obtain water at all in this way. We believe that water, in a freezing state, is unfit for the use of warm-blooded animals in the winter time; but if they must be watered at openings in the ice, it is only common humanity to do it with the aid of a trough and pail. The best mode of supplying their wants in this respect, is to have a run of water through the mangers. This can only be secured where there are stone basements and flowing springs; but many farms are provided with both, only the springs are unwisely turned to no account.

This matter of water on the farm is very large and important, having other aspects besides that of the proper care of live stock. In many cases, a proper economy of water resources would involve fish-culture. Thousands of creeks all over the country once teemed with speckled trout, and many a relishing meal they furnished the early settler, when meat, and indeed food of every description, was scarce. But it is a rare thing to find a solitary fish in them now. Yet there is no good reason why trout should not still abound in streams adapted to them; and modern science has proved that fish can be bred, reared, and fatted just like poultry, pigs, or any other live stock. But what "fancy farming" this would be deemed by not a few, who would nevertheless find a dish of nice trout very toothsome and welcome now and then!

Proper management of the water on a farm brings in the whole subject of drainage; and in some cases, attention to this, would, of itself, secure an adequate supply of water for the stock, since there is enough moisture permeating certain descriptions of land, to maintain a constant outflow from drains.

Irrigation also comes under the head of "water on the farm." We are persuaded that large tracts of land might be flowed to advantage, and immense yields of grass and other crops obtained in this way. Some localities are admirably situated in this respect, and might be irrigated with very little expense and trouble.

The formation and management of cranberry meadows and marshes—a style of farming which is profitably pursued in many parts of the United States, and might also be practised here—forms another branch of this large and varied subject. These topics cannot be amplified upon in this article, but it is hoped enough has been said to set some thoughtful minds at work, and thus to sow seed that may germinate and bear fruit in the direction of farm improvement another day.

Picking and Pressing Hops.

In the first place, we are told by the *Rural New Yorker*, no grower should raise more hops than he has kiln or kilns with capacity to dry within eight or twelve hours after picking; for instance, hops picked to-day should be cured or taken off of kiln as soon as possible in the morning, for the kiln to cool off, and the hops picked in the f[illegible]renoon to-morrow; if not sufficient for kiln, should be spread on kiln and lay until night, when the balance should be put on and a fire started immediately, and a good, strong heat kept up from four to six hours, the exact time depending somewhat on the height of the kiln and the thickness of the hops spread on, which never should be more than from 12 to 15 inches. The longer the hops hang on the poles, and the nearer they come to maturity, the less heat and time it takes to cure them. The kiln should have plenty of air below, not one-half of them having one-half enough; also drait enough above to let the steam escape.

Hops never should be turned on the kiln. Some time, or any time when they are dried, so the hops on the top open and the steam has all escaped it will do to go through them with a scraper or the feet, and mix them. One great trouble is, most of the hops are over-dried, which injures the flavor. This is done by keeping the heat up after the hops are nearly dried through. A sack or bag of hops, if ten-bushel boxes, weighs from 45 to 55 lbs., which depends on the length of time the picker is picking the same, and something on the weather, as hops wilt and settle more in warm days than in cool ones, and weigh from 14 to 17 lbs. when cured, and sometimes, if picked clean, 20 lbs. to the box after being cured.—This is to show you what moisture has to be taken

out of a box of green hops, which, I suppose must escape in the steam.

Diseased or mouldy hops require more heat and more close attention than a sound hop; and often hops diseased will be very bad at the bottom of the poles, and some at top of poles sound, as my friend Door Russell's, in 1867. I found by taking them off the kiln hot, that the diseased hops, which had begun decomposing when picked, almost all break up leaving sound hops to shew—as when examined by dealers they always open a whole hop.

Now as to using brimstone: As a general thing, there is too much used. Of course it depends on what condition the hops come off the poles, there is a kind of rust on hops that brimstone will help, and there is a sort of canker comes on hops that brimstone will not affect; and there is one kind of a green hop that may be benefited by using brimstone, making them a straw color, and there is another kind of green hop it had better be kept off entirely If the dryer be a good judge, he will make the proper distinction.

One thing more: Growers often pick hops too soon, and then brimstone too strong, to make them look as if they had come to maturity. I have always used more or less brimstone, still I hold that no hop has that fine, sweet flavor that a really good judge can detect, when brimstone has been used. My mode of using it is to use a little after the first fire, if they need it, for three or four hours, and by no means use too much at a time, but often, and in small quantities, as the hops may require. Still, I think, as a general thing, hops would suit brewers better, if there was never another pound of brimstone used.

I would strongly urge upon growers under no circumstances to pick their hops too early Among other objections, the vines are, by premature picking of the hops, greatly damaged. And when they are picked, do not let one picker stand all day filling a box, nor should they be left in the sack. In either case, the hops often heat, and are damaged

I will give you the principal reasons why hops should be treated as I say:—

1. They should be spread on the kiln soon after being picked, for the reason that they will heat in the sack within three to five hours after being picked.—The greener hops, or the first picked, if the day be warm, will heat within three hours, or, if diseased or mouldy, they will heat sooner, and after being heated in the sack, never can be brought back to the original flavor they would possess if dried as soon as picked, or spread on the kiln, where they will keep cool until cured, or a fire started.

2. There should be a fire started as soon as possible after they are on the kiln, and keep a good, strong heat from four to six hours, and then a slow, gradual heat until they are seen to open on the top of the kiln.—The result would be, if the fire were allowed to go down after the heat has been up, say two hours, the hops would be full of steam, which would settle back, and the hops would be a leaden, dull color, and also affect the flavor.

3. There cannot be more than from 12 to 15 inches well cured on any kiln at a time. The result is, you will heat or over-dry the bottom ones before you dry the top ones, unless you should take from 15 to 20 hours to cure the kiln, and even then they would sour.

4. There should be plenty of air below the stoves. Here is where most of dryers fail. When the hops lie on the cloth 12 to 15 inches thick, it requires a strong current of cold to air to drive the hot air through them; and the result is, if you do not have it, the hops will have a dull, wilted color, and also affect the flavor.

5. A kiln of hops should never be turned. The result of turning them when about one-half or two-thirds dried through is this: The damp hops, which are on the top, are, of course, full of steam, and heavier than when put on the kiln, are either mixed with the dry ones, or, if turned with a shovel, are put directly under the dry ones—consequently, the steam having to pass through the dry hops to escape, gives them a bad, dull color.

6. I will add they should be spread on the kiln as evenly as possible, so that they will all dry about the same time; and, as I have mentioned, after these are seen to open on the top of the kiln, then make a slow fire and go through them with the feet, and they will be dry enough, or three-fourths of the stems will be cured down, and the remaining one-fourth will cure in the pile, and be fully cured I will add that they should lay from 15 to 20 days before being pressed. But if it should be necessary to press immediately, two slow fires should be made after mixing with feet, with care not to over-heat them, as the heat passes through the dry hops very quickly.

English Farmers Lectured.

Mr. J. J. Mechi, the celebrated English agriculturist, writes to the *Mark Lane Express* a characteristic letter, from which we make an extract as follows:—

"Like reform, free trade and other great political changes, agricultural reform must be carried by agitation. Carried, it certainly will be, because truth will prevail in the end, and the prospect of an empty stomach is so alarming an affair that it will have a very sharpening effect upon the perceptive organs. Although my men are used to machinery, they cannot help showing a dislike to a reaping-machine, although I lend it to them, with horses, at two shillings per acre, and thus put money in their pocket, but they see that it displaces human labor, and as that is their "stock in trade," we ought not to be angry with them, although it and the threshing-machine relieve them from their most severe labor; but we have also farmers' prejudices impeding agricultural profit and progress

"There is a mistaken attachment to the open farm-yard and its escaping manure, instead of adopting the covered yard principle, although the latter is proved to be the most advantageous; but landlords are perhaps most responsible for this prejudice, because, as they will not allow their tenants to sell straw for paper making, (as I do,) the tenants, whose capital will not permit the consumption of all the straw as food, are compelled to use it as a mop or sop to absorb the falling rains and the washings from untroughed buildings Land-owners and tenants, too, should remember that the value of a ton of straw as mere manure is only 12s 6d. (see Lawes), while it can be sold for paper-making and other uses at more than 40s. per ton, and as food it is worth fully that sum." Covered yards require less than half the straw used in open yards For every five tons of straw sold compel a tenant to purchase and consume one ton of rape or good cotton-cake or linseed-cake, and both the land and the farmer's purse would be improved.

"Another mistaken and most unprofitable practice is that of taking the animal to the food instead of bringing the food to the animal—I mean as regards cattle and horses—and the roaming at large of sheep, which latter should be close folded within iron hurdles, removed twice daily. This reform will be a "big job," and a long time coming, because we were for centuries a pastoral people, and are only now emerging from permanent pasture, which still encumbers one-half of the United Kingdom Some 400 years ago there was a great outcry about its decreasing, but it was then as twenty acres to one acre of arable; now it is one for one. The same remark applies to animals as to ourselves—it cannot be right to be compelled to walk, sleep, and deposit on our food.

"Another tremendous responsibility attaches to our land-owners and law-givers. To the first I would say, down with your hedges and useless timber; let your tenants be in a position to use the profitable steam-plow, which requires large and rectillinear fields, and no longer permit me to be astonished by hearing from a Devonshire land improver that he had thrown six fields into one, and in reply to my question. how large it was now, said six acres, and seemed astonished at my being astonished. 'Oh!' he said, 'in the next little parish (not 100 miles from Exeter) there are 171 miles of fences;' but he could not tell me how many trees. Artificial shelter at the present rent of land is cheaper than natural hedgerows and trees, and although we are still obliged to use timber for a few fast frigates, iron, nothing but iron, is becoming 'the order of the day,' and will be so many long years after our wooden ideas have vanished."

Potato Blight and Rot.

Dr Thomas Taylor, of Washington, D. C. communicates to *The Lens* the result of experiments upon potatoes. from the examination into the chemical and structural theories of Dr Lyon Playfair and the fungoid views of several leading mycologists

Among other tubers, one-half of a potato brought from Santa Fe, New Mexico, was placed in water with a diseased specimen and the other half in water to which sugar had been added. An Ohio potato was similarly arranged, and the effect of allowing it thus to remain for a considerable period noted. On the twentieth day, the Ohio specimen had entirely dissolved, while the Santo Fe potato was unmjured. Comparing the portions in the sugared water, the Ohio tuber appeared a mass of infusorial life, mycelium, and budding spores, with a strong odor, no starch cells being discernible.

The New Mexican specimen showed few infusoria, and the starch granules arranged in cellulose, between which bundles of mycelium and budding spores appeared in profusion. No liberated granules were visible. Since these experiments, orther northern and eastern varieties have been tested by fungoid solutions in contrast with some of the New Mexican varieties giving like results, clearly demonstrating the superiority of the Santa Fe potatoes, over all others thus far examined, in respect to their powers of resisting fungoid and infusorial action.

We note that the government is about to test, by samples of every variety of potato from the above mentioned locality, their anti fungoid qualities in the open field and in contrast with the usual varieties grown in that section of the country.—*Scientific American.*

Roots as Manure.

It has been found that the roots of a good crop of red clover left in an acre of land after the removal of the crop weigh 6,580 pounds, or from three to three and a half tons. The same examination gave the weight of an acre of rye roots at 3,460 pounds. (A similar experiment gave the weight of the roots of alfalfa from one acre at over five tons). All of this matter is of course valuable for the use of such crops as may be grown during or after its decomposition. The well known superiority of clover as a manuring crop, however, is not due alone to the greater amount of organic matter, taken mainly from the atmosphere, which the roots supply, but also to the position in which this matter is deposited.

The roots reach deeply into the soil, and on their decomposition they serve to draw moisture from the lower soil, and by the decomposition of fertilizing matter to a considerable depth, they induce the descent of the roots and crops to a point where they are much more sure of a supply of moisture during the dry seasons than they could be if nearer the surface, Then again, these deeply penetrating roots traverse parts of the subsoil not heretofore open to vegetation, and in their decomposition they produce a chemical effect on the inorganic substances that lie along their courses, and help to render them, too, serviceable for future crops.—*American Agriculturist.*

Wasted Trouble.

There is no use in manuring land to grow weeds; in buying tools to rust out under a stone wall, in erecting buildings to rot away for want of paint and care; in buying animals and leaving them to the unhindered action of disease; in accumulating manure to fill the air with its exhalations, and the brooks with its leachings; in raising forage to floor a barn-yard with; in buying land to yearly lose its strength and virtue; in growing crops to feed unheeded insects. Yet more than one of these defects may be seen in almost unrestrained operation on every farm in the country, and the extent to which they lower the average success of our farmers is greater than would be believed.—*New York Herald.*

Mr. J. J. Mechi says:—From long practice and observation, I venture to predict that the future of agriculture, as regards the well-feeding of the people, and the profit of the farmer, will depend upon meat-making, and wheat and barley growing concurrently, especially on that extensive portion of the kingdom suitable for cereals rather than for pasture.

Reducing Bones.—Mr. Potter Warren, of New Hampshire, at a recent Agricultural Convention, gave the following easy and cheap formula for reducing bones. If the farmer will set aside a cask, in some convenient place, for the reception of bones, and throw all that are found on the farm into it, he will be likely to find a collection at the end of the year that would prove a valuable adjunct to his manure heap:—"Place them in a large kettle mixed with ashes, and about one peck of lime to the barrel of bones. Cover with water and boil. In twenty-four hours all the bones, with the exception, perhaps, of the hard shin-bones, will become so much softened as to be easily pulverized by hand. They will not be in particles of bone, but in a pasty condition, and in excellent form to mix with muck, loam or ashes. By boiling the shin-bones ten or twelve hours longer, they will also become soft."—*Plantation.*

Grasses and Forage Plants.

The Uses of a Grass-Crop.

The cultivation of the natural and artificial grasses, and other forage plants, no doubt originated in the necessity of providing food for domestic animals during winter, and at such times as pasturage could not be resorted to. It would be interesting to have the history of hay, for example,—to know who invented it,—whose mind hit on the useful idea of curing and storing up the green herbage of the field. Very likely it was an accidental thing. Some grass in its most succulent state had been cut for another purpose, and a hungry graminivorous beast ate it with such evident relish, that the inference became plain, and hay-making came into vogue. From appearances, it would seem hardly uncharitable to conclude that many farmers regard this original use of grass crop as the only one for which it is worth cultivation. To have enough feed to carry the live-stock through the winter, is the beginning and end of all their ideas on the subject.

"Well, what matters it," the cursory reader and superficial thinker may ask, "so long as the creatures are duly provided for and fed?" We answer, there can be no good farming when so narrow a view is entertained, and it is every way desirable that whatever is done on the farm would be done intelligently and well.

The first and most important use of a grass crop is to preserve and if possible increase the fertility of the soil. These results are attained in two ways:—by resting the land from incessant grain-growing, and by providing a store of manure with the droppings of the animals fed on the grass. Both as a rotation and a fertilizer the judicious cultivation and home consumption of grass are of immense value. The two phrases "judicious cultivation," and "home consumption,' however, mean a great deal. Seeding down while the land is in good condition; top-dressing if there are successive cuttings taken off; mowing at the proper season; curing in the best possible manner; are comprehended in the former phrase:—while feeding it all to the stock of the farm; eking it out with roots and grain to make it go as far as possible, and using the utmost and wisest economy in regard to it, are comprehended under the second phrase.

Another use of a grass crop is to lessen and lighten farm labor. While in grass, land needs no ploughing, and in this country, where the growing season is so short and hurried, this is a most important consideration. Every farmer should aim so to balance and arrange the work of his farm, that while the whole year should be consecrated to industry, there should be as few great rushes as possible. The strain of regular, moderate, systematic toil, is far less than that of excessive effort now and then. Moreover, many are compelled to hire at certain times because of the urgency of work, that must be done just then, who on a better plan, might dispense with the hiring, to the advantage of their profits. In Britain, grass lands are left unbroken for long terms of years, and there seems no good reason why with improved methods of husbandry, we might not do the same, thus enabling us to bestow more and deeper ploughing on the fields that are broken from year to year.

There is also a mechanical effect of grass on soils of a certain texture. They loosen, aerate, and mellow them. If we include the clovers among the grasses, as we fairly may in treating of the uses they subserve, their long tap-roots are eminently serviceable in mechanically improving stiff-lands. A similar influence is exerted when sod is ploughed under. Every farmer knows into what a nice condition a soil is brought by the rotting of a good green sward. This would be even more perceptible than it is, if we kept our grass lands in higher condition by top-dressings of well-rotted farm-yard manure, and artificial fertilizers.

Speaking still of the clovers, there is no small store of wealth in their blooms. Those of them that are accessible to "the little busy bee," as are the white and alsike varieties, are, in this country, the great source of the honey-yield. A completely stocked farm will have its apiary as well as its pig-sty, sheep-fold, and poultry-yard, and there are none of the live-stock that will yield a more profitable return, than these untiring insect workers.

Moreover the grass-field is the source of one of the great charms of country life. Not poets and romancists merely but ordinary work-a-day people, delight to inhale the smell of "new made hay," and the season of hay-making is by common consent a time of merry-making and enjoyment. A farm without any meadow would be strangely incongruous and defective.

Orchard Grass for Permanent Pasture.

In answer to enquiries from a correspondent, the *Western Rural* has the following article on the above-named valuable plant:—

"Orchard grass is one of the most valuable of our early grasses, and ought to be more generally experimented with. It has, also, the quality of growing admirably in the shade of trees, and therefore, on well drained soils, is valuable. It thrives well on dry, well drained and especially on rich sandy lands. There is no doubt of its permanency in such localities; and, ripening as it does about the same time as clover, it is valuable in connection with this forage plant. Its especial value is the early feed which it makes in the Spring and its quick growth after being cut or cropped by animals, except during drouth, when, like other fibrous-rooted grasses, it starts slowly.

It should be sown, when not in connection with other grasses, at the rate of not less than one bushel of fourteen pounds to the acre. If sown thin it is apt to form stools or tussocks. The middle of August in your latitude is a good time to sow it. If not then, have the land properly prepared, smooth and mellow on the surface, and sow as early as possible in the Spring.

Orchard grass contains about 40,000 seeds to the ounce, and the seed ordinarily weighs twelve pounds per bushel, or fourteen pounds when thoroughly cleaned. Timothy weighs forty-four pounds per bushel, and contains about 74,000 seeds per ounce In seeding for a permanent pasture, orchard grass should always form a large proportion of the varieties used.

The following quantities, recommended in "Grasses and Forage Plants" will give a good general idea of the quantity of seed used for this purpose The great mistake usually made is sowing too little seed. For permanent pasture it is recommended to sow:

"Of meadow-foxtail, meadow fescue, red-top and rough-stalked meadow, each two pounds; orchard grass and perennial rye-grass, each six pounds; Kentucky blue grass and Italian rye-grass, each four pounds; timothy and red clover, each three pounds; white clover, five pounds, sweet scented vernal grass, one pound, making in all forty pounds of seed per acre."

This would give the enormous number of 54,000,000 seeds per acre, or about eight seeds to each square inch. That it is not too much is evident from the fact that old close swards in England have been examined, upon a square foot of which were about 1,000 plants, or seven to each square inch. One of the great mistakes among American farmers, in seeding both meadow and pasture land, is the sowing of far too little seed to make the acreage give the quickest and largest returns.

RED TOP GRASS.—A correspondent of a Minnesota paper writes: "Red top grass will do well on good fair wheat lands. Sown with grain it makes a firm, even sod, and is good for pasture or hay It starts early in the spring, and is better relished by stock for early spring pasturage than Timothy grass. It is believed to be more free from dust than Timothy when cut and well cured for hay. Good, fair lands may yield one and one-half tons per acre As grass or hay it is fine, sweet, nutritious, making a firm, even sod, well adapted to plough under to enrich the land. There has been an old impression that red top absolutely requires wet, swampy land, but such opinion seems to be erroneous. I think it may be made one of our staple crops for home use. In sowing, be careful not to bury the seed too deeply, as it might not come up."—*Prairie Farmer.*

TIMOTHY.—In his interesting essay on "Grasses and their Culture," the Hon. J. Stanton Gould, in alluding to our common timothy *(Phleum pratense)*, states that the largest stock of which he has any knowledge, was raised by Rev. Charles Collins, of Montgomery county, Pa. It was seven feet, eight inches long. The heaviest crop raised in this country was that of John Fisher, of Carroll county, Md., making five tons, and 1620 pounds of cured hay per acre. The heaviest crop he had ever seen was that of Geo. Geddes, near Syracuse, who cut three tons of prime hay from a single acre. The authority states that an experimental plot at Woburn, England, cut 40,837 pounds (18 tons, and 517 pounds) of green timothy per acre, which lost 23,451 pounds by drying.

Implements of Husbandry.

Portable Scaffolding.

It is often necessary to fix up eave troughs on the barns, or dwelling-house; fasten boards or doors at a distance from the ground, which may have become loose, repair the roofing, and a dozen of other different nick-nacks, all of which require the use of a ladder in order that they may be reached; and this unwieldy article often entails much loss of both time and patience; for, should the work to be done, extend over more than a few feet in area, the operator has to descend perhaps repeatedly, and keep moving his ladder this way and that, until the whole is completed—thus, probably, wasting more time in his shifts than all the rest of the work put together.

There is a simple form of scaffolding which obviates all such inconvenience, and it is made thus: Take two pieces of scantling, 4 x 4, or 2 x 6, each about three feet long, and nail them together at their extremities, so that they will form a right angle; brace them well by means of two side pieces of inch board, that they may be quite firm. Next, take a long pole or scantling, from ten to twenty feet, according to the degree of elevation wanted, and cut the one end of it to fit nicely into the angle already mentioned, when the pole itself, or scantling, stands at an angle against the side of the building. Repeat this process—that is, make one or two more of the same, and your scaffold is complete. In using it, two men are required, sometimes three, when a middle, or third support is needed. Set up your angular pieces (first described) against the building, with one end on the ground, and the other jutting out towards you, and whilst in this position, set on them what ever planks you require for a footing; then insert the prepared end of your poles or scantlings into the angle, and raise the structure by their means as high as you desire; press the lower end of the pole into the ground, and all is ready and quite secure. By simply moving the lower end of your pole nearer to or farther from the base of the building, the entire scaffold is raised or lowered at pleasure.

Punching Holes in Straps.

The punching of holes through the various straps of a harness, for buckle-tongues, and for attaching the buckles, is a matter of considerable importance, and does not, as a rule, receive the attention that it should. The old method, of punching them from the upper, or grain side of the leather, has been generally abandoned by the manufacturers of fine work, it being deemed injurious to the wear of the leather. The principal objection arises from the liability of the grain of the leather to crack from the strain of the buckle-tongue, and to be the cause, eventually, of the leather tearing, as it causes such a crease where the tongue catches, that it injures the texture of the leather, and makes it tear the hole more or less. In addition to this, if the leather is very strong, the tongue of the buckle is sure to be be bent out of shape. All these objections can be obviated by punching from the under or flesh side of the strap, and by using a punch, the long sides being parallel with the length of the strap; the punch should be set at an angle of about twenty degrees, cutting the hole at such an angle that the buckle tongue will rest in it without throwing any strain on the inside of the leather.

Some object to punching the hole from the under side on account of its forcing the grain out, and thus disfiguring the outside edges of the hole. This can be corrected, however, by driving the punch through the hole from the outside, which will cut away the slightly turned edge of the grain, and set it down smooth and clean. It is not necessary, however, to repunch any holes except those that will be exposed when the harness is complete. Punches should be as thin as possible, as the extra thickness of the metal strains the leather.—*Harness Journal.*

Straw Cutters.

The remarks hitherto made upon the advantage of chopping or cutting up food for cattle are equally, if not still more forcibly applicable to straw and hay, for on these, not only does the cutting enhance their value as food, but, in many cases, fodder which has become mouldy or musty through age or neglect, when cut up, and mixed with something more savoury, is rendered serviceable again, and all consumed We have known of whole stacks being thus utilized when the animals wouldn't taste them in their natural state.

Corn stalks, moreover, and Hungarian grass—in fact, any of the coarser-fibred grasses, almost necessitates some crushing or softening preparation before they are served up.

Now, to perform this by hand, with a knife or shears, would be simply absurd—hence the introduction of the straw cutter.

The earliest, or amongst the earliest forms of the cutter, consisted of a box, in which the fodder to be cut was placed, with a small rectangular opening at one end, through which the fodder was pushed along towards the knife. When a sufficient quantity—say one or two inches—was pushed through, a foot lever at the side was stepped upon by the operator, who thus brought a wooden block down upon the fodder immediately behind the knife, with sufficient force to keep it well compressed for cutting. The knife was then brought down upon it. This latter was a simple blade attached to a wooden handle, one end of which was jointed to the box, and the other worked

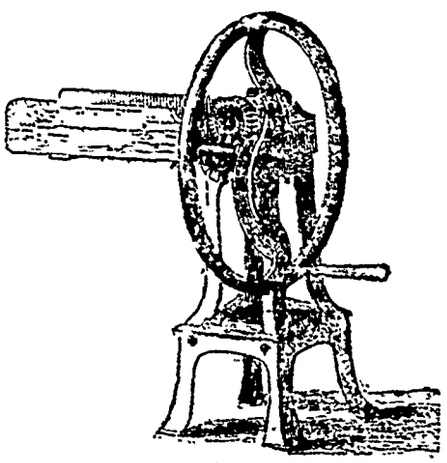

FIG. 1.

like a lever. This kind was soon superseded by another—which, in many respects, resembled its predecessor, but the knife, instead of being worked directly by the hand, was inserted in an iron framework, which, by the operator's turning a crank at the side, glided vertically up and down after the manner of upright saws. In it was also introduced the self-feeder. Another, of still later date, was the "Roller" machine—in which the cutting apparatus consisted of a series of steel blades set around a wooden roller, with their edges outwards, so as to work against another roller of the same kind, but without blades. In some cases the blades were arranged in a semi-spiral manner around the roller, but for the most part they were set straight. Many of these machines are still in use, being comparatively cheap, and give good satisfaction. They are also self-feeders—that is, the rollers constitute both the feeding and cutting apparati at the same time—the length of cut being determined by the distance of the blades apart.

Our first cut in this number represents a very good hand-power, iron frame, concave knife, chaff-machine—one which has become very popular in its various modifications. It is made entirely of iron, except the tail-box. The shafts are wrought iron, with rising rolls and mouth-piece. It can be attached to a horse-power by simply screwing on a coupling instead of a crank, and cuts easily into parts five-sixteenths of an inch long. Its mouth-piece is from eight to ten inches wide.

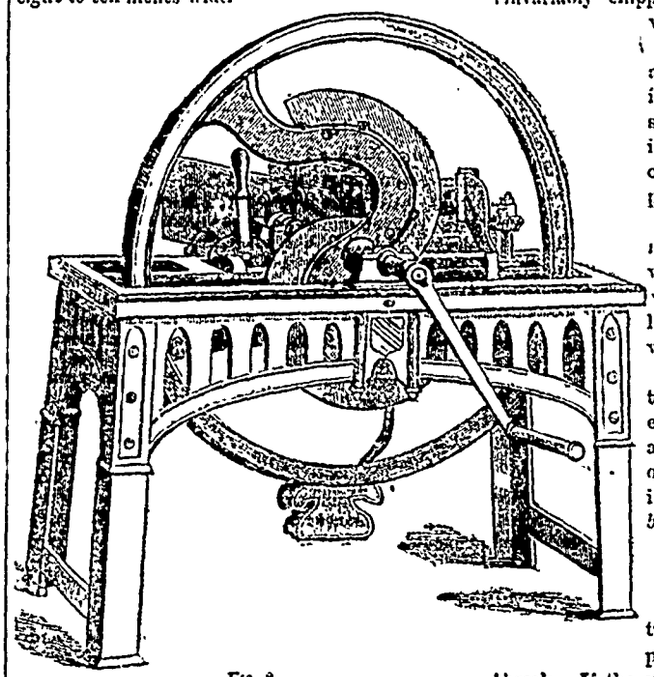

FIG. 2.

Our next is a machine of English origin, which has a very high reputation on both sides of the Atlantic. It is also a hand-machine. The frame is cast-iron, with brass bearings for the principal shafts. The knives also are concave, and work against a steel mouth-piece.

A peculiar feature of this machine is the application to it of Gregory's delay motion, a contrivance which arrests the onward motion of the straw, whilst the knives are cutting—thus obviating a large amount of friction, which would otherwise have to be overcome by the power. By changing the crank for a pulley, it also may be driven by horse-power.

Our third represents perhaps one of the best cutters now before the public—a power machine, self feeding, and capable of cutting with ease a ton per hour into lengths of ¾, ½, or ⅜ of an inch, as may be desired, the change being effected by a different adjustment of the gearing In the event of anything going wrong, it can be thrown out of gear in an instant

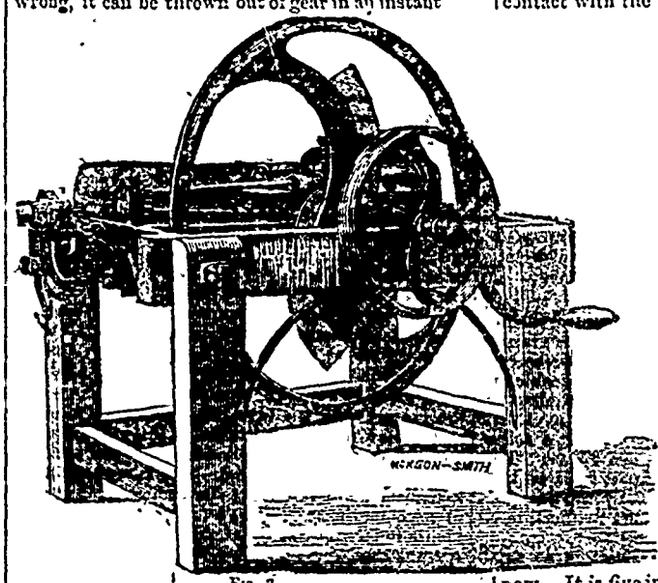

FIG. 3.

This machine answers admirably the purpose of a pea-thresher, leaving the straw cut up in the best possible manner for feeding.

This was the "large medal" machine at the recent International Exhibition, at Buffalo.

In using these machines, the utmost care should be taken to see that no pebbles, sticks, &c, are amongst the stuff to be cut, as if there are, the knives will be invariably chipped, perhaps broken, and accidents will ensue from the flying splinters.

The question is frequently asked, also, what kind of oil is best for our implements? In answer, we would say, that whilst oil in general rises in quality with its price, good olive, or sweet oil, is for all practical purposes the best that can be used.

As is the case with all other implements, the straw cutter should always be kept in a dry place, under cover, and when laid aside for a length of time, the blades should be well oiled, to prevent their rusting

When they may have become dull, they may easily be sharpened again, either by taking them off the wheel, and applying them to the grindstone, or by the handier process of sharpening with a small file, applied to the *bevelled* side of their cutting surface

Using Nails.

Every farmer who has occasion to drive a nail into seasoned oak posts knows its liability to bend and break. If the point be moistened in the mouth, it will usually drive more kindly. Oil is much better, but then it is inconvenient to dip each nail separately into it. Another point is that boards become loose eventually from the rusting of the nails, which communicating to the wood, causes not only an enlargement of the nail hole, but the wearing away of the nail itself, rendering the fence or building shaky and insecure.

This may be prevented by heating any rough grease, until it smokes, and then pouring it over the nails to be used. The grease will penetrate the pores of the iron, and cause the nails to last, without rusting, for an indefinite period. Besides this no difficulty will then be experienced in driving them into the hardest wood. The reason is that the coating of grease prevents contact by air, and consequently oxidation.

Oxygen is the great destroyer of iron, and moisture is the inducing cause. Anything which is kept from contact with the air is preserved indefinitely, and if it is kept dry, the effect is measurably the same. Paint upon buildings prevents the contact of air and moisture. If the whole fence can not be painted, the heads, at least, of the nails should be touched therein.—*Exchange.*

BAROMETERS FOR FARMERS.—In several papers, more or less agricultural, we notice that the barometer is recommended, and sometimes a particular barometer is named, made in New York or somewhere else, especially for farmers, which is a little suspicious. Farmers themselves, however, do not appear readily to fall in with the idea. And this is wise, unless they obtain a first-class instrument. The French one called *Aneroid* we prefer to all others. Its cost formerly was about $15. It may be $25 now. It is five inches in diameter, looks like a timepiece, and is hung up like a watch. But to understand it properly it must be carefully and constantly observed. Occasionally it completely baffles one, and we believe even the clerk of the weather himself does not know what sort of capers are about to be indulged in.—*Germantown Telegraph.*

Agricultural Chemistry.

Nature's Laboratory—(Continued).

BY C. M. SMITH, M. B.

Food of Plants—Vegetable Extract.

This name is applied to the products of vegetable decomposition, which remain after extraction of the inorganic portion. It consists, according to Mulder, of seven organic substances, viz.: crenic acid, apocrenic acid, geic acid, humic acid, ulmic acid, humin, and ulmin; he divides these into two groups—the humic, including geic, humic, and ulmic acids, humin, and ulmin; and the crenic, including crenic and apocrenic acids. Excepting humin and ulmin, these are soluble in water and alkalies (potash, &c.). They form salts with ammonia, in the soil. According to Mulder, this ammonia is formed by the union of nitrogen with the hydrogen passing off from putrefying substances. Of these acids, apocrenic and crenic have the valuable property of uniting with several bases, such as potash, lime, ammonia, &c., thus bringing them into a fit state for assimilation by the plant. According to the same author, the whole series is formed by the oxidation of ulmic acid, which takes place when the air is confined among the deeper particles of the soil. A certain proportion of this extract is necessary for the nourishment of higher plants, although, indeed, that proportion need be but small. All that could be extracted from twelve decoctions of pure mould was one-eleventh of its weight; and this seems more than sufficient for vegetation, for such a mould was found less favorable than one containing a less amount, at least for beans and peas. But on the other hand, it was found that plants were far less luxuriant in a mould deprived of its extract, than in one not so treated. A due supply of these compounds of organic acids and ammonia is especially necessary for the growth of such crops as wheat, corn, oats, &c., which, unlike grasses and clover, seem to have but little power of obtaining their nitrogen from the air.

Artificial Food (Manures).

Just as the physician finds it necessary when the nutritive fluid of the mother is deficient in quantity or quality, either so to improve the constitution of the parent, as to ensure a due supply of proper nourishment for the child, or to substitute a more or less artificial fluid, so must the farmer improve the mother soil by an incessant supply of materials which have either been exhausted, or are naturally wanting, and which are necessary for the healthy growth of various crops. To continue the illustration:—it sometimes happens that although the proper food for the human system is provided, the powers of digestion and assimilation possessed by that system are so feeble, or have been so impaired as to require an artificial tonic or stimulus; so, although a soil may possess all the necessary ingredients, and in some cases, perhaps, an excess, it may be an important object with the farmer to stimulate the growth of the crop by increasing the plant's powers of assimilation. These two important ends are secured by the scientific application of *manures adapted to the soil, and to the kind of seed to be sown.*

We shall classify the artificial food of plants under four heads, viz animal, vegetable, mineral, and mixed, or compost.

I.—Animal Manures (a) Night Soil.

As might be expected, from the omnivorous character of man, this variety of manure is rich in the different inorganic ingredients of the vegetable and animal kingdoms. Luderlius' analysis of the ashes gives in 100 parts:—

Chloride of Sodium (salt), Sulphate of Potash, and Soda		1.36
Phosphate of soda,		2.64
Soluble salts		4.00
Insoluble salts.	Phosphate of lime and magnesia,	80.37
	Sulphate of lime,	4 53
	Phosphate of iron,	2 09
Silica,		7 91(?)
		98.93
Loss		1.07
Total		100.00

It also contains albumen, mucus, bile, fat, &c., rendering it susceptible of change by putrefaction or fermentation. It may well be called a soil, for it is evident from the above composition that it wants but alumina, or clay, to form a perfect substitute for fertile earth. When added to earth, the nascent nitrogen of the albumen, &c., unite with the hydrogen given off in putrefaction, forming ammonia, which unites with the crenic, and apocrenic acids, the products of oxidation, as above mentioned, forming basic salts, containing potash, soda, ammonia, and lime, in union with the acid. Thus the ammonia is held from escaping, while at the same time the insoluble salts of the manure are converted into soluble compounds. Any decaying vegetable matter furnishing acids of the humic group, will, of course, answer the same purpose, if the earth to which the manure is to be applied is deficient in vegetable extract. This is exemplified in the use of composts, to be hereafter described. In parts of the east this variety of manure is sold at the rate of about ninety cents per annum for each individual. The Protestant portion of the population realize about a franc more per head than the Catholics, on account of the difference in diet! The Chinese apply a solution of the material directly to the seeds, believing that it hastens the process of germination. It is possible that the nitrogenous matter contained in it may act in the same way on the starch of the seed as the substance called diastase, namely: by converting it into sugar.

Chamber-Lye.

The amount of solid matter contained in the quantity of urine passed by one individual during 24 hours, may be set down as about 1,000 grains, of which about 700 consist of nitrogenous substances, and 300 of fixed salts. A substance called *urea*, containing a large proportion of nitrogen, constitutes from one-half to three-fourths of the former portion. About twenty grains of muriate of ammonia (sal ammoniac) exist in the same quantity. Of the latter ingredients, chloride of sodium (salt) exists in the proportion of 170 grains; the phosphates of ammonia lime, magnesia, and soda, 60 grains; and sulphates of potash, &c., 70 grains. Traces of silica, and iron, have also been found present.

The composition of urine renders it peculiarly liable to decomposition, and thus accounts for its active agency in the fermentation of composts. The chief product during such decomposition is carbonate of ammonia. When mixed with lime, and other substances contained in solid manures, the ammonia is seized on by the stronger acids, and converted into less volatile salts, while the carbonic acid forms a carbonate with the lime.

Excrements of Horses, Cattle, Sheep, and Pigs.

These, of course, vary considerably, according to the variety of food consumed. The liquid portion contains little or no *uric acid* (a product of excretion, which has suffered a less degree of oxidation than that which results in *urea*). On the other hand, this substance is largely present in the excrements of birds, as, for example, in guano, which is a compound of uric acid, and ammonia. The substance called urea, alluded to above, is present in a larger proportion in the urine of animals which are employed in labor, as the horse, and ox, than in that of the cow, pig, or sheep. The liquid excrements of animals fed on hay, clover, and turnips, as cows and sheep, contain carbonic instead of phosphoric acid, carbonates of lime and magnesia, instead of phosphates of the same earths, and carbonates, hippurates, and sulphates of the alkalies (potash and soda), instead of phosphates, and urates. The phosphates of lime and magnesia are contained in the solid excrements of these animals instead of in the liquid, as in man. The solid excrements of the horse yield about 30 ounces of salts and earthy matters, when the food consists of 3 gallons oats, and 15 lbs. of hay daily. The following table shows the percentage of morganic material in the urine, and solid excrements of the horse and cow:—

	Urine.		Fæces.	
	Horse.	Cow.	Horse.	Cow.
Potash,	28.97	66.74	9.33	17.15
Soda,		1.31		6.30
Carbonic acid,	27.28	31.04		
Lime,	27 75	1 74	5.22	7 31
Magnesia	4.22	4.09	2.03	4.50
Iron,	.79	.31	2.03	3.34
Sulphuric acid,	6.43	4.03	3.92	3.23
Silicic acid,			59.95	41 00
Phosphoric acid,			7.92	17.05

It will be noticed from the above that the urine of the cow contains more potash and carbonic acid than that of the horse, while the proportion of lime in the latter far exceeds that in the former. In the solid excrements, we notice that of the cow contains nearly twice as much potash, about ten times as much soda, twice as much magnesia, and more than twice as much phosphoric acid as that of the horse. Silicic and sulphuric acids are more abundant in the dung of horses, than in that of cows. The food of the horse whose dung furnished the above analysis, consisted of 3½ lbs. of oats, with 4 lbs. of rye bread, instead of the usual quantity of oats fed in this country. The cow had about 52 (?) lbs. distillery dregs, from *potatoes*, 12 lbs. rye straw, 2 lbs. of hay, 1 lb of pea straw, 1 lb. of oat straw, 1 lb. of barley straw, and 12 lbs. of beet root.

It may be interesting to see what loss the farmer sustains, when he follows the usual practice of allowing the fluids from his stable to drain away into the nearest streams, or filter through the subsoil of his yard. In the case of the liquid from the horse-stable, the main part of the potash, lime, carbonic and sulphuric acids are carried away with it, while that from the cattle stalls, though not containing so much lime, has a certain quantity of soda.

Thus we find that it is of special importance to the farmer, whose soil is either deficient in mold, or is not provided with a limestone basis, to carefully save the liquids from the stable, and apply them in the form of composts.

Where sheep are kept in such a way as to admit of the collection of the dung, it forms a valuable addition to more bulky manures applicable to roots. During pasturage, of course, the manure acts as a top-dressing. But, as a consequence, of the fat and wool producing qualities of the sheep, we find but little carbon and nitrogen in the excrements.

Pigs being chiefly fed on a highly nitrogenous diet, namely, peas; and storing up the carbon, hydrogen, and oxygen, in the form of fat, produce a manure which is again applicable to the crops which furnish the animal's food.

Dung of Barn-yard Fowls.

This consists chiefly of earthy phosphates, and uric acid, and, consequently, according to theory, should prove beneficial to those crops which have but little power of absorbing their nitrogen from the air, and require also the presence of the phosphates. Such are wheat, oats, and corn; to the latter of which, experience has proved the advantage of its application, either alone or comomed with ashes.

Slaughter-House Offal.

This material, which in many towns is allowed to lie putrefying, and sending off its noisome, volatile ingredients, to regale the olfactory organs of the inhabitants, might be utilized in helping to form compost heaps. The large proportion of nitrogenous substances contained in it render it a valuable assistant in the process of fermentation of green manures.

Bones.

These are employed either after calcining, or simply crushing, or when dissolved by the aid of oil of vitriol. When a soil already contains sufficient organic matter to cause blackening when strongly heated, bones prepared in the first mode will do as well as the dust. But as phosphate of lime is the essential fertilizer in this manure, it requires the presence of organic material, either in the soil or in the manure itself, in order to furnish a sufficient supply of carbonic acid to the water, so that it shall be able to dissolve the phosphate. Consequently, where a soil is deficient in organic ingredients, the dust is preferable.

The CANADA FARMER for 1865, contains an article giving figures to show the value of this manure, even on the crop immediately following; the trials being made with oats, potatoes, and Indian corn. The same journal for 1866, contains a simple mode of dissolving bones by means of wood-ashes, and caustic lime. Liebig has advised the addition of sulphate of lime to the pasty substance produced by solution. Besides being valuable as a food for cereals, it has been proved to be a valuable top-dressing to meadows and pastures. In the experiment above mentioned, it was used in the average quantity of 600 lbs. to the acre. The solvent power of water containing carbonic acid, or phosphate of lime, is seen in graveyards, which are moist, and either situated in such a position as to allow of drainage, or overlie a porous subsoil; for the whole of the phosphate of lime contained in the bodies is carried away, leaving a substance called adipocire, consisting merely of the fatty acids.

Farm Yard Manure.

In No. 18 of the CANADA FARMER we gave a brief sketch of the principles on which the benefits arising from the use of farm yard manure depend, and of the manner in which it restores to the land the very elements of fertility which have been taken from it in the crops, and that, too, in a condition admirably suited to absorption and assimilation by the plant. We there briefly alluded to the fact that much of the most important contents of the manure heap were soluble in water, and called attention to the loss of this precious material by drainage.

The subject, however, is so important that it demands further consideration. Fresh farm yard manure contains about two-thirds of its weight of water. The remainder consists of organic and morganic matter. Of the organic matter about one-eleventh is soluble, and the remainder insoluble. Of the inorganic matter about one-fourth is soluble. Rotten dung contains three-fourths of its weight of water, and of the remaining solid portion one-fifth is soluble in water. This soluble portion contains lime, potash, magnesia, ammonia, sulphuric and phosphoric acids, all of which we have seen to be of the utmost importance as plant food; and yet how little care is taken to preserve them.

In too many cases, the dung-hill stands in the middle of the yard, perhaps on a hill-side, and unprotected from the weather. The consequence is that every shower of rain soaks into the heap, dissolves out more or less of its valuable material, and runs away laden with its spoil, to waste it in some roadside gutter, or to contaminate some neighboring spring or pond. By this practice, too, the liquid manure is almost entirely lost. Now liquid manure contains, on the average, in every 1,000 parts, 912 5 of water 63 5 of organic matter, rich in nitrogen, and yielding by decomposition much ammonia, and 24 of inorganic matter, very rich in phosphoric acid, potash and soda. These exist already in solution, and these even without the assistance of rain or snow, drain away and are lost to the farmer. This loss is no trifling matter. The plant constituents in question have been taken from the land, and unless they are restored, or replaced, the land must inevitably be deteriorated, and ultimately become reduced to that deplorable condition which may be seen in too many long cultivated districts where it is utterly incapable of supporting a remunerative crop. This is no fanciful prediction. It has been verified, and is being verified at the present day. The punishment of neglecting Nature's laws may be slow, but it is as certain as day and night.

A glance at the neighborhood of many an old manure heap will show the value of this material which is so thoughtlessly, and so unregrettingly wasted all over our land The course of the water as it drains away with its load of plant-producing treasure, may be marked at every step by a rank growth of *weeds*. The nourishment has been taken from the fields and thrown away in nursing to luxuriant growth the farmer's great enemies. Even this is better than when the ponds from which his cattle are supplied, or even the well from which his children drink are contaminated by the drainings from the dung-hill, and that which should have been employed in producing bread and meat, in bringing to the husbandman health, wealth and comfort, is transformed by his own ignorance, or neglect into a source of pestilence and death.

To avoid this loss of invaluable material, the manure heap should always be constructed in such a manner that the drainings from it may be collected and used in moistening the remainder. The best method of storing dung is in water-tight receptacles, which communicate with a tank, into which the liquid which drains from the manure may run The heap may then, from time to time, be watered with this liquor, and thus the entire value of the product of the farm yard may be realized.

The extra trouble and expense of this arrangement will, in the long run, be amply compensated by the increase in the quantity and quality of the crops. This is not only true in theory, but the experience of practical agriculturists on both sides of the Atlantic, has amply proved it to be the case.

Another point of great importance with regard to farm yard manure is the relative value of fresh and rotted dung During the fermentation of manure, the straw and the undigested food which it contains, are decomposed, and yield, in addition to other products, water, carbonic acid, and ammonia, all three important elements of plant food. A large portion of the water and carbonic acid that escape is a matter of but little consequence, as most arable soils contain an ample quantity of these substances. It is otherwise with the ammonia. Some of this valuable product of the fermentation of manure escapes into the atmosphere, as is evident by the smell of ammonia always more or less perceptible in a stable, but the quantity lost in this way is not considerable when the heap is allowed to remain undisturbed. A variety of acid products of the same fermentation serve to seize this volatile substance and retain it in the manure. The compounds of ammonia are almost all soluble in water. Ammonia itself is extremely so. One cubic inch of cold water will dissolve 700 cubic inches of ammonia gas; and if no precautions are taken to guard against loss by drainage, a large proportion will be washed away, and rendered unavailing in this way. Otherwise, the well rotted dung will be found not to have lost much of this important constituent of plant food; and if it is laid on the land as soon as ripe, that is as soon as the fermentation is nearly complete, the full value of the manure will be immediately restored to the soil.

If the fresh dung is ploughed into the soil, the same process of decomposition goes on, but more slowly, and its beneficial effects, though not so immediately perceptible, will be spread over a longer period. The fermentation of the manure in the soil has also an important mechanical effect on the soil itself. This may be rendered plain by an illustration. Yeast is a substance which has the property of setting up fermentation in certain substances. When yeast is mixed with dough it sets up fermentation in the dough. One of the products of fermentation is carbonic acid, and when this gas is liberated in the dough it causes it, by its mechanical action in effecting its escape, to swell up and become porous or "light." Now, carbonic acid is also, as we have seen, produced by the fermentation of manure, and when the fresh manure is mixed with the soil, carbonic acid is liberated within the soil, and just as in the rising of bread, the liberated carbonic acid causes the stiff dough to swell up and become porous, so the carbonic acid, set free in the soil by the fermentation of the manure, breaks up the stiff soil and renders it light and porous. In stiff clay soils this is an advantage, but in light sandy soils it is unnecessary and injurious.

When, therefore, the mechanical influence of the manure is not desired for the purpose of improving the physical condition of the soil, and when it is wished to obtain the full immediate fertilizing action of the manure, well rotted dung is much preferable to fresh. In the case of turnips and other root crops, it is indispensable to encourage as much as possible a rapid growth; and hence in the case of these crops, well rotted farm yard manure should always be employed.

We have seen that the value of farm yard manure consists in its containing the constituents of plant food that have been taken from the soil in the crops. No fertilizing element is *created* in the manure. In spreading on his fields the product of his farm yard, the husbandman only restores to the land what he has taken away from it. He adds nothing new. Each successive year he takes from his fields so many pounds of ash ingredients, so much lime, magnesia, potash, soda, sulphuric and phosphoric acid; and each year he restores a greater or less proportion of this identical material in his fermented straw, and in the droppings of his cattle. He cannot restore by this process more than he took away. He may, and usually does, return much less. A very large amount of morganic matter is annually removed from the soil in the various spears of grain. In the case of oats, Indian corn, and peas, much of this is returned as manure, after having been fed to horses, cattle, and pigs; but the ash ingredients removed from the soil by wheat and barley, are not so restored. It may at first sight appear that the quantity of inorganic material so removed is so trivial as to be of no practical consequence. Let us see if this is really the case. A bushel of wheat contains 60 lbs., so that 30 bushels will contain 1,800 lbs. of wheat grain. Wheat grain contains about 2 per cent. of ash, and hence 1,800 lbs. of wheat contains 36 lbs. of ash. A crop of 30 bushels to the acre will, therefore, take from the soil 36 lbs. of those inorganic constituents which form the food of wheat. In the course of years this will make a great difference in the fertility of the soil. No addition of farm yard manure will compensate for this loss. The inorganic materials which the farm yard manure contains have all been taken from the soil. If they are taken from a different field, then that field must suffer in the same proportion that the wheat field gains.

This wheat is consumed as food by man himself; and the only way in which he can compensate for the loss to the soil, caused by the removal of the ash constituents which it contains, without resorting to artificial fertilizers, is by employing as a manure the refuse matter of his own digestive processes. Hence the great value of night soil for agricultural purposes. In China and in Japan this fact is fully recognized, and has been for ages. There the utmost value is attached to a material which, with us, is only looked upon with disgust; and while we seek only to get rid as quickly as possible of this substance, and allow it to run to waste, to contaminate our rivers, and to spread the germs of disease among our dwellings, they carefully preserve it, and with them it becomes a most valuable article of merchandise between the city and the rural districts. The consequence is that these people have maintained, for generations, their land in the same fertile condition in which they received it, and caused it to supply for centuries the daily needs of a dense population.

The utilization of sewage is one of the most important questions of the present day, and one which urgently demands wise and judicious legislation. But legislation will fail of its effect unless the people at large, and the agricultural community in particular, are fully aroused to its absolute necessity. Unfortunately, we do not recognize the value of what we are losing. The subject is too common to excite our notice, and while we ransack the furthest recesses of our own and distant lands for gold, we fling away the wealth that lies at our feet.

IN SUMMING up an article in favor of better horticultural education in this country, the *Gardener's Chronicle* says—"At present we are obliged, to our shame be it spoken, to send our sons to Belgium for instruction in the higher branches of the science and practice of horticulture, and to Germany, or France, for systematic instruction in forestry. For the latter course, there are some reasonable excuses in the larger extent, and more systematic management of the forests; for the former there is none that we know of."

A large, natural swarm of bees carries with it four or five pounds of honey when leaving the old hive.

Horticulture.

EDITOR—D. W. BEADLE, Corresponding Member of the Royal Horticultural Society, England.

THE ORCHARD.

Effects of the past Winter on Fruit Trees in Iowa.

Samuel Foster, of Muscatine, Iowa, writing to the *Horticulturist*, says that the Ben Davis apple tree was very much injured, so much so, that while it bloomed full, it had not sufficient vitality to grow the fruit after the blossoms had fallen; and yet the Ben Davis had long been classed among the most hardy varieties, and put in the lists for Northern Iowa, Wisconsin, and Minnesota. On the other hand, the Wagener, which has been very much damaged by less severe winters, came out green and bright, setting full of fruit. He mentions Alexander's Early, Warfield, Duchess of Oldenburg, and Wealthy, as having proved hardy the past winter. Of these sorts, Alexander's Early is not mentioned by Downing; Warfield is described as having originated in Muscatine, Iowa, the tree, a thrifty, vigorous grower, an early and abundant bearer, the fruit of a medium size, of a light water yellow, with a blush in the sun, moderately juicy, mild sub-acid, valuable for cooking, and in use in October. The Duchess of Oldenburg is known to most of our readers as one of the best cooking and market apples, ripening in September Wealthy is, according to Downing, a native of St Paul, Minnesota; fruit medium in size, whitish yellow, shaded with deep acid crimson, juicy, vinous, sub-acid, quality "very good;" in season from December to February.

Mr. Foster says, also, that pears are considerably damaged, but does not mention varieties; and cherries slightly damaged, adding that the English Morelle is proving as hardy as Early Richmond, and a better cherry every way, two weeks later. Of grapes, he names Concord, Ines, Martha, and Clinton, saying that others have mostly failed. Small fruits generally were badly damaged, but the Bernard blackberry, a native of Ohio, stood the winter very well.

How to Protect Fruit from Birds.

A correspondent of the *London Field* says that his method has proven entirely efficacious. "And what, you will think, is my talisman? Simply a ball of gray or whity-brown linen thread. I take a ball of this in my hand, fasten the end of it to one of the twigs of the gooseberry or currant bush, and then cross the thread backwards, from twig to twig in perhaps a dozen different directions, fasten off, and the thing is done, and it will last two years—the thread on the trees, I mean. It is not necessary the thread should be white or coarse: it ought rather to be fine and dark—a thing to be felt, not seen. I have watched the birds after performing the operation; they come boldly to settle on the trees, and they strike against these, to them, invisible snares for such no doubt they deem them to be; they fly off in a terrible hurry, and settle on the walls and trees around about, longing and getting hungry, till at last they disappear, and you will see them no more.

As regards peas, and other seeds, which I always sow in drills, I simply stretch a thread, sometimes two, along each drill at about two inches from the ground, supporting it at that height by little forked sticks. If you put it much higher than this the birds do not seem to care for it; it does not touch them; that is the grand secret, something they do not well see, nor know what it means. I have seen people put a thick white string, with feathers tied to it, and perhaps two feet from the ground. The birds soon understand these, and care little for them; in short, I know to my cost that it sometimes acts as a lure, as a notice to the birds that there is something to be had worth looking after. I will answer for it, any one adopting the plan I recommend will never have cause to complain of the birds, however numerous they may be.

Keeping Apples in Sawdust.—E. R., Putnam Co., N. Y., writes the *Country Gentleman* "I made an experiment last winter and spring of keeping apples in dry sawdust, with good results. I packed several barrels, putting in a few at a time, and then filling with dust by shaking down. These kept fresher and better than the others. I kept Vicar pears by this means until late in the spring. In March or April I put some choice Roxbury Russets into a barrel with sawdust, and having more than we wished to use, some were left in the bottom. On the 4th of October I emptied the contents and found one apple almost sound—the rest in perfect form, though decayed. Later, about the 15th, I emptied a box of English Streaks left in the same way, and found one entirely sound."

Fruit in Persia.—Fruit in most parts of Persia is of excellent quality and flavor. The native poets have celebrated the produce of each district. Ispahan boasts the best flavored Musk Melons; Nishapour, the largest Water Melons; Holwan, the most delicious Figs; Kirmanshah, the best Apricots; and Shiraz, the finest Grapes. Undoubtedly Persia has a good right to boast. We owe to her many of our finest and most favorite fruits, and she still devotes more care than any other Eastern nation to their culture. The Melons of Ispahan are tended with the greatest attention. In the best gardens they are placed on tiles, and turned round several times a day, in order that each side may ripen equally in the heat of the sun. The result is that they probably excel in flavor any melons in the world. They are esteemed a great delicacy in Persia, and are sent as presents not only to the cities of the interior, but even to Baghdad, and the holy place of Kerbela and Nedjef, in Arabia.—*Quarterly Review.*

The Orchard House.

Peaches and Nectarines

The Peach, and its smooth variety, the Nectarine, were introduced into this country about the year 1562. They are, no doubt, in all respects, the trees *par excellence*, for the orchard-house, and, in order to extend their season of production as much as possible, it is advisable to cultivate a considerable number of varieties. These may either be planted out in prepared borders or beds of soil, which should be rendered as firm and solid as possible, or they may be grown in 15 or 18-inch pots, firmly potted and occasionally surface-dressed with rich compost, and watered with manure water. I feel inclined to give a preference to the former system of culture. But it would, perhaps, be the safest, as well as the most satisfactory plan, to practice to some extent both methods. The trees may be trained in the form of pyramids, half standards, or dwarf bushes, but the first-named form is to be preferred. This must be secured by careful pruning, or rather by stopping and pinching the young or maiden trees during the growing season, so that very little winter pruning will be required during the first two seasons at least. This may be done either early in the month of November, or may be deferred until the following February, and, should the weather at that time be very severe, it may be still further deferred. The spring or late pruning of these trees has the advantage of the bloom or flower-buds being more fully developed, consequently the operator can the more easily distinguish the bloom from the leaf buds. But, generally speaking, there is but little difficulty in doing this, even during the autumn. It will also be understood that in shortening the shoots, it is always necessary to cut close to a triple-bud if possible, otherwise, to a single or leaf-bud. The triple-bud consists generally of a wood, or leaf-bud, in the centre, with a bloom-bud on each side. And if a shoot be cut to a single bloom-bud, or to one or more bloom-buds, where the leaf or wood-bud is absent, the shoot must necessarily die down to the next single leaf or triple-bud. As Peach and Nectarine trees are always exceedingly liable to the attacks of insects, such as the green fly, thrips, and red spider, &c., it is consequently always advisable to dress or paint the trees after they have been pruned, with a composition such as has been already recommended, or with a solution of Gishurst's compound of about the strength of 8 ounces to 1 gallon of water. But, whatever dressing may be used, care must be taken in using the brush, so as to avoid injury to the fruit buds, and this precaution is the more necessary if the pruning has been delayed until the spring is somewhat advanced, and the buds are beginning to swell.

As soon as the fruit is fairly set, a system of syringing must be commenced, and this, it will be necessary, in most cases, to continue until the fruit begins to approach a state of ripeness. The fruit should be thinned out to some extent as soon as it attains the size of small peas, and should again be examined at a later period, and further thinned should this be found necessary; and if, in any case, any tree or trees in pots may have failed to set a crop of fruit by the beginning of July, they may, with advantage, be placed for a time in the open air, together with a few trees of any variety, which it may be desired to retard in ripening. This will give additional space to planted out trees, and others which may require the same. Indeed all trees in pots may, with great advantage, be placed for a time in the open air after their fruit has been gathered. It may hardly be necessary to say that Peaches and Nectarines at all seasons, when the weather is mild, require free ventilation. After the beginning of July, air should be admitted at night as well as during the day, unless it be during the prevalence of high and boisterous winds. It has already been said that the Peach and Nectarine season may be very considerably prolonged by the judicious selection of varieties. The following list has consequently been divided into three distinct sections, that is no say into early, medium and late:—

Early Peaches.

Early Beatrice.—Said to be the earliest of all Peaches.
Early Louise.—An early and good sort.
Early Rivers Peach.—A good early sort.
Rivers' Early York.—Good and early.
Acton Scot.—An excellent early Peach.
Crawford's Early Peach.—The finest of the yellow fleshed sorts, possessing a peculiar aroma.
Early Albert.—A richly-flavored fruit.
Early Admirable.—One of the best early Peach.

Peaches, Medium as to their time of Ripening.

Dr Hogg.—Hardy, vigorous and prolific; rich flavored.
Royal George.—A well-known good variety.
Grosse Mignonne.—Large and fine.
Belle de Croix.—A very large and fine sort.
Stirling Castle.—A very fine new sort.
Noblesse.—One of the best of Peaches.
Lord Palmerston.—New and good variety.
Prince of Wales.—New and one of the best.

Late Peaches.

Salway.—Flesh of deep orange color; very fine.
Barrington.—Hardy, handsome and good.
Beliegarde.—A fine handsome sort.
Walburton Admirable.—An excellent variety.
Violette Hâtive.—A handsome sort.
Galande.—An excellent variety.
Chancellor.—Large and fine.
Late Admirable.—A good late Peach.

Early Nectarines.

Balgowan.—A large and handsome fruit.
Hunt's Tawny.—Early, with yellow flesh.
Murray.—A very early useful sort.
Violette Hâtive.—One of the very best sorts.
Violette Rouge.—A very fine sort.
Lord Napier.—A new sort, very handsome and finely flavored.

Nectarines, Medium as to their time of Ripening.

Bowden.—A large, rich, melting sort.
Downton.—A very fine sort.
Elruge.—One of the very best sorts.
Impératrice.—Large, juicy and good.
Pitmaston Orange.—A first-rate yellow-fleshed sort.
Prince of Wales.—A fine new sort.
Rivers' Orange.—One flavored and productive.
Old White.—A very distinct variety.

Late Nectarines.

Oldenburgh.—Will hang long upon the tree.
Victoria.—A fine variety.—*Peter Grieve, in Garden.*

Influence of Foliage on Roots.—When a seed germinates its first efforts are to send a root downward into the soil and leaves upward into the air. The seed contains within itself the elements of nourishment for this process. The further extension of roots depends upon the extent and healthy action of the foliage, hence any destruction of foliage during growth will have a correspondingly weakening action on the roots, and to that extent impair the vigor of the plant. So far, then, as the weakening influence will encourage fruitfulness we may "prune in Summer for fruit."—*New York Herald.*

Freak of Nature.—Four years ago Mr. Charles Chase, of Weare, laid a cement pipe thirty-five rods for the purpose of conveying water into his house. At the time the pipe was laid, a small gimlet-hole was made in it, for the penned air to escape, into which cotton was pressed, and a large stone placed over it. A few months since the water began to flow as if obstructed, and finally ceased entirely. Recent investigations discovered the fact that a black cherry tree had sent a root down to the pipe, which in its course threw aside the stone, and then pierced its way through the hole, and sent two branches, one in each direction completely filling the tube for more than four feet. Mr. Chase has specimens of the root, which, with its myriads of tiny fibres, closely resembles jute.—*Mirror and Farmer.*

THE FRUIT GARDEN.

Fungoid Disease of Plums.

[*To the Editor of the* CANADA FARMER.]

FRIEND FARMER,—I suppose a great many of your readers as well as myself have noticed the ravages of some kind of rot amongst the plums. The fruit assumes a decayed appearance and is dotted over with small rungi and the plums dry upon the tree till they look like little hard prunes. The disease affects whole bunches which stick together, and this year it destroyed a great many, particularly of green and yellow gage plums. I could not discover any worm or insect in the decayed fruit; the disease appeared of a vegetable kind, and if your Horticultural Editor can give any receipt which will effect a cure, he will much oblige many of your readers as well as yours faithfully,

Fergus, 4th Oct., 1873. BELSYDE.

Can any of our readers give the desired receipt?

The Ithaca Grape.

Dr. S. J. Parker, of Ithaca, sends the *Country Gentleman* the following description of the Ithaca:

"I send you herewith a sample of my Ithaca, or Tucker's Parker grape. You see that the berries are about the size of Isabella, in a bunch shaped like the Delaware; and that the grape is so clear in its yellowish green, that the seeds show through when the light shines on it. The stem of the bunch clings so fast to the vine as to need scissors to cut it off, like a foreign vine. The berries cling to the stem, and the skin is quite thick; yet the pulp is soft, and the fruit is quite sweet for such a poor year. The smell of the mass of fruit is not in the least foxy, but rose-like in perfume. The flavor is mild, and slightly like Chasselas Musque.

"I consider it, all things considered, the best of all American white grapes, as it is early and perfectly hardy. The original vine is now six years old from the seed, and bore this year nearly a bushel of fruit. It has been larger in berry each year of bearing, and fuller in bunch. The bunch resembles the Delaware, though the shoulder is a little less in size than that grape. The berry is twice the size of the ordinary Delaware; hence the load of fruit to each vine is large."

The California Grape Crop.

The following statements are from the San Francisco *Bulletin*:—

"The wine made in this State last year fell considerably short of the estimates which had early in the season set down the probable production at 10,000,000 gallons. Whereas, the actual amount was, according to the estimates of wine makers well up in the business, not much above 5,000,000 gallons.

"From the same source we learn that the most careful estimates for the present year do not place the yield much above 3,000,000 gallons. Two reasons are assigned for this shrinkage. First—The frosts, which were the most severe that had occurred in the State for many years. The frosts came late in the spring, just at the transition from blossom to fruit. Second—The excessively hot weather of the summer months has thickened the pulp of most of the wine grapes, making them "fleshy," and while the quality has really been improved, the prices have been diminished.

"The price of the better sort of grapes has advanced moderately this year the average for these in bulk being about 2½ cents. But irrigated Mission grapes in Los Angeles County have brought not much above ¾ of a cent per pound, while Sonoma Mission grapes, not irrigated, have brought about 1 cent a pound.

"Considering the number of new vines which were expected to come into bearing this year, the crop must be set down as a very small one. Probably so many untoward influences may not combine against the grape crop again in ten years. The eight million gallons which were the more moderate estimate for 1873, have settled down to about three millions, with a proportionate shrinkage in table-grapes. But they are good, and that has been the principal consolation of the grape-growers."

The Enemies of the Cranberry Crop.

The cranberry crop is short in many parts of New England on account of the drouth, the worms, and other enemies. This fruit, though growing mostly upon peat bogs and swampy places, is as much affected by drouth as other crops, especially upon the thoroughly drained and gravelled or sanded plantations. The fruit fails to set well or if already set the fruit is small. The remedy for this is to have the water raised in the ditches to a point where the roots will reach it without flowing the plants. The fire-worm and the vine worm are among the worst enemies of the cranberry grower. Flowing in the spring is a complete remedy for the vine-worm, and if prolonged late enough in the season it will destroy the other. Many growers draw off the water early in May when the parent moths are most active. It is now pretty well settled that the water should be kept on until the first of June, or if drawn off early in May it should be put on again for a week at the close of the month. At that season the water is warm enough to destroy the eggs. The latter is the practice of our most intelligent cranberry growers. Discretion, however, is to be used in the drawing off of the water. If the vines are covered to the depth of three feet or more the water would probably be too cold at the bottom to kill all the eggs. It should be drawn down so low as to barely cover the vines and give the surface the full benefit of the sun. Where the water is abundant and under control it is the better way to draw off the water about the first of May, and let it on again from the 20th of May to the first of June, according to the earliness of the season. It would be still better if the plants could have a third flooding ten days later, but in this case the water should only be left on for a day or two, lest it might injure the fruit buds. Many bogs are injured by winter killing. Flowing in winter is an effectual safeguard against this. The water should be put on as early as the first of November, or at least before there is any danger of freezing, and the bottom of the ice that may form should be kept above the tops of the plants. With these precautions cranberries are more reliable on well prepared plantations than most other fruit crops.—*American Agriculturist.*

THE IN-DOOR PLANTS.

The Walking Fern.

This interesting and rare plant called by botanists, *Camptosorus rhizophyllus*, is found growing in small patches on shaded limestone rocks near Owen Sound, Co. Grey, Ont., although Prof. Gray makes no mention of its presence in Canada in his Manual. I have obtained specimens measuring fully a foot from the root to the tip of the frond, and more than an inch in breadth at the base. It may be recognized by its shape, like an arrow much elongated, the upper portion narrow and grass-like, and by the peculiar appearance of the fruit dots on its under surface. These latter organs reach their maturity about July, and resemble a number of minute larvæ or worms of a brownish color. Each of these fruit-dots consists of a pair of thin scales (*indusium*) enclosing a number of lime-shaped seed-cases or spore-capsules. When the seed or spore is ripe, these scales separate and the spore cases are burst by the straightening of the elastic ring which surrounds them. By this process the spores are scattered to a distance in the air.

But, as is often the case in the lower classes of both the vegetable and animal kingdoms, the propagation of this plant is provided for in another manner. At the end of the drooping grass like frond, a bundle of radicles or roots are developed, which taking root in the soil give rise to a new cluster of ferns in the ensuing spring. The plant receives its name from this peculiarity; *each successive crop or generation a step in advance of its predecessor.* By this mode of reproduction it forms mats of more or less extent, the clusters being connected one with the other.

It has been successfully cultivated in a Ward's case by providing a suitable soil of vegetable mould, moss and fragments of limestone. As it is rather coriaceous in structure it does not require as much moisture as most other ferns. C. M. S.

Owen Sound, Sept, 29, 1873.

Cattleya Trianæ.

This is one of the most beautiful of all our winter-flowering Cattleyas, and, when well grown, it makes a fine plant either for home decoration, or for exhibition purposes. Like its congeners, it varies considerably both in the size and color of its broad-petaled flowers. One variety has sepals and petals of the most pearly whiteness, the lip being white with a faint lemon-yellow blotch in the throat. Another form has deep rosy flowers, the lip being blotched with dark velvety crimson, and between these two extremes we find a whole series of variations, distinguishable only by slight differences in the length or breadth of the floral segments, or by their slightly varying shades of soft coloring. This species grows well in an ordinary plant stove, or intermediate house, and does best in a fresh, open, well-drained compost, consisting of fibrous peat, Sphagnum, and coarse well-washed river-sand or grit. If the moss is encouraged to grow over the surface of the compost all the better, and an abundant supply of moisture is necessary during the summer and autumn months. This variety of Cattleya generally flowers very freely in January or February, and the flowers last in perfection a fortnight or three weeks if kept free from cold, damp, and drip. If grown in quantity it will keep up a succession of delicately tinted flowers for two or three months at a time. In some collections it is known under the name of *C. Warscewiczii*, *C Warscewiczii delicata* being the palest variety.

Odontoglossum Alexandræ.

It is allowed that this noble Orchid is one of the most beautiful of the genus to which it belongs, but it may not be equally well known that it is as easy to grow, under certain conditions as a Heath or an Azalea. In one or two places I could name it is cultivated by the hundred, and flowers can be cut from it any day in the year; still the plants are not coddled, and in one instance they are grown by the dozen in an ordinary brick pit, with the lights propped up on fine days, in order to give them an abundant supply of air. Under these conditions, they grow freely, and make pseudo-bulbs 4½ inches long, and nearly as thick as one's wrist—great plump bulbs, surmounted by fine bronze-tinted foliage, indicative of the robust constitution infused into them by a moderately cool temperature, abundance of tepid moisture, and full exposure to both light and air. This species does well for a time in a hot temperature, beneath heavy shading, but it certainly does not require stove treatment; indeed, in the long run, the plants are positively injured by it, and do not flower nearly so profusely as those grown in a cooler temperature with plenty of air. It has been called a greenhouse Orchid, but it requires much more humidity in the atmosphere than is accorded to greenhouse plants in general. A house partially sunk below the ground level, or one naturally moist, is well adapted to this and many other "cool Orchids." Under favorable conditions this plant keeps on growing for a considerable portion of the year—indeed, the resting season so necessary to many Orchids from the tropics is, in the case of this *Odontoglossum*, reduced to a minimum, and the plant should on no account be allowed to become thoroughly dry at the root. As regards compost, nothing is better than fresh fibrous peat broken into small lumps with the fingers, the small portions being rejected. To this add about one-fourth of dried horse droppings and a handful or two of leaf-mould. With this mix a little well washed sand, coarse road or river sand being preferable to white sand, which allows the compost to settle so closely together as to become sour and stagnant. A little chopped Sphagnum is added by some growers. Use small pots, nothing being so fatal to good Orchid growing as over-potting, and see that they are thoroughly well drained with clean crocks. The pots should be about two-thirds full of drainage so as to ensure every facility for the escape of superfluous moisture. In potting, elevate the bases of the bulbs slightly above the rim of the pot, pressing the compost firmly around the fleshy roots without bruising them, and finish off the surface with a layer of fresh living Sphagnum, which should be encouraged to grow as freely as possible. Living Moss suits this and many other cool Orchids well, as it keeps the surface of the compost clean, and the roots in an equable state with respect to moisture. One of the chief charms possessed by this plant is the variableness of its flowers, scarcely any two being exactly alike. They vary not only in size and form of the segments, but also in color, some varieties being pure white, while others have their sepals and petals heavily suffused with rosy lilac, and the sepals and lip variously blotched or spotted with reddish-brown.

Spiræa Palmata.

This promises to be a good plant for forcing, and i is beginning to be appreciated as such As in th case of Spiræa japonica, plants of it intended fo forcing should be potted in the autumn, about November, and should be plunged in ashes, or som such raw material, in the open air, and kept shelter from heavy rains; as soon as the crowns show symptoms of swelling the plants may be removed t a suitable house, and pushed on into growth, increasin the temperature as the time of blooming is approache I saw last spring some nice dwarf vigorously grow plants of this Spiræa that had been treated in thi manner, each bearing five or six spikes of flowers. A a matter of course, it will never be got into flower s quickly, or be made to bloom so freely, as Spiræ japonica; but it is very charming indeed when it panicles of bright rosy-crimson flowers are full expanded.—*The Garden.*

THE PERFUME CROP.—Schomburgh says that 150,000 gallons of handkerchief perfume are consume yearly by Europe and India. The revenue from im ported perfumes in England is estimated at a quart of a million dollars. The materials used are jas mine, mignonnette, verbena, rose, heliotrope, rose mary, peppermint, violets, orange, etc.

A PERPETUAL FLOWERING PELARGONIUM.—W saw in Mr. Bull's Nursery a new Pelargonium name Queen Victoria—a perpetual flowering hybrid, whic promises to be a good addition to this class of plant The flowers are bright rosy-carmine, edged with white and have a dark blotch on the petals. The plant i of fine habit, blooms freely, and has curled parsley like leaves.—*The Garden.*

HALEANA HONEYSUCKLE.—Oh! how beautiful with its profusion of yellow and white flowers, an the air so filled with the delicious fragrance. It superior to anything in the running line we have ev seen, and so hardy too. Perfectly exposed to th severe blasts of the past winter, it has come throug alive to the very top. We wish every reader of th *Recorder* had one or two of these growing. We know they would thank us for urging them to plant them out.

LAGERSTRŒMIA INDICA ROSEA.—It may interes some of your readers to learn that this beautiful rose-colored flowering shrub which has hitherto bee treated as a stove-plant, need no longer be considere as such, as it is almost, if not perfectly, hardy, hav ing stood out in an open border throughout the whole of last winter, without any kind of protection in the gardens of the Royal Society, of Ireland, nea Dublin, where it would doubtless have bloomed wel this summer, had not an inexperienced under-gardene not knowing that it was deciduous, cut it down t the ground when he saw all the leaves had fallen off Notwithstanding this severe treatment, however, the plant shot up vigorously from the root, and when I saw it a week ago, had made shoots close on 3 feet in height, which were entirely covered with abundant healthy foliage, and in fact, in every way looked in better health than my own plant of it which has always received stove treatment, and i only brought down to the cool conservatory when about to open its lovely racemes of blossom, resembling pink frizzled paper, and which are the admiration of everyone who sees them. I may add that the winter climate of Dublin is, I should say, quite as severe as that of most parts of England.—*The Garden.*

MYOPORUM ALBUM.—This elegant flowering shrub is well worthy of more general cultivation for decorative purposes than it receives, as it is free in habit and easily grown. It can be propagated by means o cuttings made of the young wood, as readily as a geranium, or even more so, for branches torn from the plant and thrown carelessly on damp sand or soil root freely in a week or two, and go on flowering as if nothing had happened to them. The plant grows from 12 to 18 inches high, having a central stem from which the branches fall gracefully on all sides. Both branches and foliage are of a deep green color, studded with translucent tubercles, smaller, but not much unlike those of the ice plant (*Mesembryanthemum crystallinum*). The flowers are borne in axillary clusters, and are something like those of a small-flowered *Eriostemon;* they are pure white in color, and slightly scented. The plant is grown extensively in France for the Parisian flower markets, where it may now be seen in abundance. It is not only a most profuse bloomer and elegant in habit, but it lasts in beauty for two or three months together, during the summer time, and it may be easily cultivated in perfection in a cool frame, or in the sitting-room window. Any soil seems to suit it: but a compost of fibrous loam, leaf-mould, and coarse sand is preferable to any other. Cuttings struck now will make fine little plants for next summer's flowering.—*The Garden.*

The Dairy.

EDITOR—L. B. ARNOLD, OF ROCHESTER, N. Y., SECRETARY OF THE AMERICAN DAIRYMEN'S ASSOCIATION.

Fine Butter in a Private Dairy.

Butter factories and creameries, as a rule, mak better butter than the average private dairies, bu hey are not yet so far perfected as to equal the bes rivate make. Their goods will not keep as well nor are they so fine, in any of the associated dairie we have ever seen, as those we have met with i rivate establishments. There are some obvious casons for this failure in factories to reach the highes ttainable perfection. First, the milk can hardly b ransported the distance usually necessary to reac factory, without injuring it somewhat for butte aking; second, the mass of milk being made up o ifferent dairies that are liable to differ in quality ome of them will not be as good as the best; an hird, it is doubtful whether the combination of cir umstances at any butter factory are yet quite equa o the best private dairies, though the average of th atter is very much above the average of the latter

An illustration of the practical results of factory nd private dairy practice was met with in Franklin o., N. Y., in September last. While visiting the actories before described, which were considere y parties well posted, to be as good as any, if no he best in that vicinity, we visited also the private airy of B. F. Jewett, the inventor of the pan bear ng his name Mr J has a dairy of 50 cows, righ n the neighborhood of the best factories. His milk as derived from the same breed of cows, and from he same kind of pasturage, with no advantage o oil or location, or other circumstance external to th airy management, but yet his butter was superio o that of any of the factories, both in its new an reserved condition. The factory butter was esteem d by some as gilt-edged. If so, then Jewett's wa gilt with finer gold. It was indeed a very choic rticle, and the yield from a given quantity of milk was greater than was obtained at the factories at the same time. When the factories were using 23 lbs of milk for one of butter, Mr. J. was taking 20.2 He used the Jewett pan, of course, and as it was op erated in the same way as at the factories, the dif erence in yield of butter was, at least, mainly du o the different circumstances in the dairy and th actories. Mr. J.'s practices were a little differen rom what is generally pursued in private dairies. His milk-room, about 14x20 feet, and 8 feet high, was located in the centre of the north side of his welling-house. Its walls were plastered, and its eiling neatly painted; its light and ventilation came rom a north window. It contained four pans 8 feet long by 3½ wide and 7 inches deep, and nothing else except the necessary pipes for the supply and waste of water, and for carrying away the sour milk. This oom was kept secure by a lock and key, and no one was allowed to enter it but when it was necessary to the care of the milk. The pans were placed 20 inches apart, with one end standing against a partition that separated the milk-room from a hall passing through the house. Through this partition, a little above the end of each pan, was a hole, which was ordinarily kept closed with a plug. By means of a tin receiver and strainer, with a tube atached, the milk, when brought into the hall, was passed through the hole in the wall, and discharged into the pan, the carrier not entering the milk-room. This prevented the milkers from carrying any filth into the room, or of polluting the atmosphere by any scent that might attach to their clothes. In this way the air in the milk-room was kept in the purest possible condition, and the milk was effectually prevented from absorbing any foreign odor whatever. By following this systematic neatness through all the operations of the dairy, his butter came out at the end of the manufacturing process, with nothing but its own natural flavor. The operations of skimming, churning, salting, working and cooling, were the same as in the factories, except that the cooling in the dairy was a little slower. These circumstances indicate whence the more perfect flavor, and larger yield of Mr. Jewett's butter were derived.

His facilities for keeping were better than obtained in any of the factories. Not far from his house was a large spring of cold water that discharged eight barrels per minute. An excavation was made in the ground close to the spring, and a spring-house built over it, with a floor below the surface, so that when the water was let in, it would rise nearly to the top of the tubs in which his butter was packed when they stood on the floor. Two sets of tubs were provided—one in which the butter was to go to market and the other every way two inches larger, in which the butter was to be placed for keeping. The tubs were all largest at the top. When the butter was ready to pack, it was packed in one of the smaller tubs for the purpose of moulding it to suit the size of the tubs in which it was going to market. Having received the desired shape, it was turned out of the mould, and placed in a larger tub, and the extra space filled with a saturated solution of brine, a bag of salt laid on top of the butter, and the tub with its butter, its brine, and its bag of salt, placed on the floor enclosed by the spring-house. A cover with a stone on it is placed on the tub, and it is left to stand in the water till the butter is wanted for market. All the butter made through the summer was standing in this way at the time of our visit, Sept. 10th. The June butter had not lost a part clo of its freshness and aroma. It had all the flavor of butter ten days from the churn. Whenever it was determined to send it to market, it was taken out of the large tubs and placed in a new tub of the size for which it was moulded, and pressed snugly, so as to make it fit the sides of the tub as exactly as if it had been packed in it when first made. No butter thus treated had been sold when we saw it, and we have not yet learned how it has succeeded in the market. It is a mode of preserving butter which cannot be generally followed for the want of a suitable spring, and it would seem to be performing more labor than is really required to accomplish the desired end. The main point is to keep the butter submerged in strong brine, and at a temperature of fifty degrees, that being the temperature of the water. If the packages in which the butter is immersed, could stand in a dry room at 50 degrees, it would very likely answer the purpose just as well. The ability to keep, by any means, butter through the season without injury, is so important that it is interesting to study any and every method by which it may be done. And this method certainly has the merit of keeping it in the most perfect manner.

Mr. Jewett seemed to be managing his dairy with good success, and it would have been very gratifying to have obtained more full statistics of his results. But it is very rare that we can find any private farmer who takes the pains necessary to know just how well or ill he is doing, though such a knowledge would be of the highest value to the public, as well as himself, by way of leading to the better practices, and averting those which fail to be profitable.

HUMBUG.—The old butter powder humbug is revived again. Our Western correspondents inform us that swindlers are operating this time in Indiana selling for $5 a recipe to make *eight pounds of butter from a gallon of milk.* It almost passes belief that any one can be found so simple as to be caught by so bare a hook as this. As a gallon of pure milk weighs about 8½ pounds, the absurdity of converting all but about half a pound of it into butter has only to be stated to be exposed. What very shallow, thoughtless people they must be who pay their money for such a transparent humbug.—*American Agriculturist.*

Poultry Yard.

Standard Characteristics, and Things in General

From the controversies now being carried on in England, my Canadian friends may be somewhat perplexed in poultry matters, and a few remarks may not be uninteresting to them. They have suggested themselves to me from an article in the last *Journal of Horticulture*, and headed "Standard Characteristics, by Lewis Wright."

Does not this article savour too much of the animus (according to my reading, too plainly perceptible throughout his illustrated book of poultry), against the editor of the standard of excellence. Two of a trade never agree, it is said.

It seems strange, after the elaborate hints on judging, given by Mr. Wright, his own standard of points, &c., that he should, on the second edition of the enemy's standard being hoisted, suddenly find out that any standard is a myth, but the standard bearer has fought in many a poultry battle, and won and cannot, therefore, be in so many instances, decidedly wrong, although Wright says so. In the article before us, he says—all have a *right* to their opinions, certainly, from which we glean that the compilers of the standard have, and being many, have a decided advantage in the battle against the one. From personal experience, nobody knows more than I do of the immense advantage to the poultry cause the standard of excellence was, especially to novices in poultry points, and I have found it a most useful friend against disappointed exhibitors in many shows that I have exhibited in. My first *debut* as an exhibitor was long before its publication, but it established, on your side of the Atlantic, fixed rules, which guided the poultry breeders from chaos to which they would, without it, have remained in until this day. Judges who were appointed frequently knew nothing of exhibition points, or their value. I speak feelingly, being a sufferer therefrom. I could spin yarn after yarn, facts of what occurred, did space permit. I must say, therefore, although I admit you cannot control the whims, fancies, &c., of judges, still, as to general ideas they agree, and an ignoramus profits even if he sticks to the text, as it gives him some definite ideas of what he has to do.

It should be remembered that the standard, as published, was not compiled by Mr. Tegetmeir, but by Mr. Teebay, and other members of the poultry club, and that it embraces the ideas of the best fanciers, and breeders, of the last ten years.

All ages should be those of advancement and improvement, therefore, a "fixed standard" can only last as trial and experience prove the necessity of no change; but I cannot see why, as things or points are altered, editions cannot be altered also; the changes are very gradual, and hence no difficulty in this respect.

There are certain fixed points that must be fixed for a time, and if not laid down, how can a novice learn.

Bailey, long ago, in his first or second edition of fowls, published a standard—the club merely went into detail of points giving them a numerical value. I freely admit that no man can take a standard in hand, unless a breeder, or fancier of poultry, and judge at a show. He must know his work beforehand, and if he had to consult any rules, why, the time consumed, would greatly exceed the duration of a show. Still, a doubt existing, a reference may be of use, and it is for the breeder, and exhibitor, that the rules of plumage are of use.

The only drawback I ever found against the standard was, that disappointed exhibitors always harked back to some fault passed over, without considering the greater superiority of other points counterbalancing the evil. As to go through an addition sum of points, especially in the one hundred point standard of Wright, would be a labor too gigantic to be undertaken in the time given to judge a show; but, that because this is the case, that no fixed standard at all is required, I cannot admit, and, I am sure, that even Mr. Wright's American friends will bear me out in this.

I will give an illustration and conclude. I must necessarily be egotistic to illustrate my case.

It would seem curious that in their native country the points of wild turkeys should not be known, and, that from carelessness, or ignorance, the several societies were robbed, I may say, of their premiums for wild turkeys, until I pointed this out at several shows, and as one of the arbitrators distinctly refused to sign the judges' book. I published the points of the wild birds (following the plan of the standard), deduced from the bird kept by myself, and from dead specimens brought into the market, and, as they were not superabundantly plentiful, I saw them nearly all, for four winters

Surely a standard was of use here; but, until pointed out, the actual points constituting the difference between wild, and half-bred, were not understood, and prizes were awarded to good and bad, wild and tame, in the wild class

Clearly, such things should not have been, and the standard acted as a preventative to their recurrence.

I think these facts show the necessity of some standard to guide amateurs, and, until another assemblage takes place, we must be content with the old love until we get on with the new.

F C. HASSARD.

"Blood" in Breeding—What it is, and What it does.

Under the above heading, Mr. Louis Wright contributes to the Poultry *Bulletin* a series of articles the first of which we take pleasure in reproducing in these columns, the subject being one well deserving the attention of the breeder and amateur.

"I have been asked to make my first paper for the *Bulletin* upon this subject, and truly none can be more important to the fancier, or its thorough understanding more essential to his success. How few do understand it is proved by the few who succeed, and by some of the statements made from time to time by various amateurs. I shall try, therefore, and be very simple in explaining what I have chiefly learnt in my own yard, since at the time I began to breed, there were no books which really taught anything about it. And I would say here, that one secret of the little success I have had, either in breeding myself, or in teaching others how to breed, has been that from first to last, I have had to *look after my own yard;* and that till very lately that yard was a very small one. I never knew any one learn much who depended on his 'man', he may succeed at shows, but it is his man who succeeds, not him. The advantage of a small yard is very great, in that every chicken you breed is under your eye, and its defects and beauties stamped upon your mind. If you have bred a bad chick you *know it*, it can't get lost to the eye in a large crowd, but your mistake is brought home to you and you are made to feel that you have not got your yard right *yet*. That chick is like the 'candid friend'—a great nuisance, but very useful nevertheless. A small yard, and by this, I mean such a space as I had all the while I lived in Bristol, only 67 x 35 feet in all—is the greatest friend a young fancier can have; and I honestly believe that the chief reason why—on an average—English breeders produce more good chickens in proportion than most, even of good American breeders, is their want of space. If you have acres of ground, and can raise your hundreds of chickens, it is very hard if you cannot, out of them, pick some half dozen trios fit for any ordinary competition But that is not *breeding*, and such birds, almost faultless though they themselves may appear, will breed a very small proportion of good chickens. But if you have only such a space as I have described, and can rear only, say three dozen chickens, the case is altered at once. Now, if out of this three dozen chickens you want to produce half a dozen trios fit to show in good company, you must breed *well*: and when by this careful breeding you have got a stock that will do it, then a trio of your best birds, properly mated, will reproduce their kind.

Let me here take a text from a correspondent of the April *Bulletin*; though I differ from him, he will, I know, give me leave in the good cause. He writes: "The idea of breeding birds to a feather, is more a matter of theory than achievement—rather a *fancy* than a *fact*, I think. Two years ago I concluded that I would try and see how near to this mark I could come; procuring a very finely marked Cock of one of the most popular varieties, from one of the most reliable and celebrated breeders and exhibitors in the Union, and putting him with a few superior hens of his kind. Out of about eighty of their progeny, there were not three that were very strikingly alike, either among the cockerels or pullets, and out of above thirty-five cockerels only one that was strikingly like his sire. From some indications in various parts of the article from which I have here extracted, I have an idea that the writer is alluding to Dark Brahmas, a variety on which I can speak from personal knowledge; and this is in fact the chief reason why I have selected his letter from several at various periods to the same tenor. Now, as to matter of fact, this variety is not easier to breed to feather than some others; but I will venture to state that I could very easily select a trio of these birds from the progeny, of which at least half, and probably two-thirds should be so uniform that only experienced eyes could tell them from the other in each sex respectively. But I could only do it from my own birds which I know, just as some other breeder could only do it from his which *he* knows. The experiment mentioned is in simple fact not "breeding" at all, but merely the chance of what a first experiment in mating may produce. There was literally no 'breeder's work' about it whatever, beyond that fancy of character may have belonged to the purchased Cock; and if this bird, as very likely, was simply one of the best from a large flock, there would not be much even of that. But I certainly do expect to get birds of a uniform high quality; and as a proof that my expectation is not a vain one, I may mention that in actual fact, I last year only hatched thirty-eight chickens, out of one brood of eight chickens in these one cockerel won the special prize at Birmingham, another was fourth prize in the same class (about one hundred cockerels competing), and a third won the cup at Dundee, in Scotland. I had also a magnificent bird which was only disqualified for showing by being hocked.

What then *is* good breeding, and what is the 'blood' which we say 'tells'? It is *not* purity of race. This is the grand mistake so many make, and which the correspondent already quoted falls into, when he says that the chicks even from the "same hen" in his experiment, were not alike more than we are. The human race is pure enough in that it is not crossed or capable of being crossed with other species; but there is nothing in general about it of the nature of what we are now considering. In so far as there is, *so far* there is actual similarity in the produce. Thus, when Frederick William of Prussia, used his despotic authority to enforce the mating of his grenadiers with tall women, the result was a tall race, of which there are still evident traces in the neighborhood of Potsdam. Thus again, rich and noble families have greater power of choice in their marriages, and mankind usually preferring beautiful woman, on the average these, noble families present a far greater number of examples than other classes do, of that refined style of beauty which we call 'patrician'. Other similar proofs might be cited. And it is so in fowls also. *Purity*, merely, is not what we mean by 'blood' Let us suppose a pen of our Dark Brahmas to be bred from, and their progeny to be again bred from, and so on, never crossing the strain, but not mating up to any defined method of selection. At the end of a few years, the race will be as pure as ever, in that it consists of pure-bred or incrossed Brahmas; but its colors and other points will present all sorts of variation. Almost every breed will thus degenerate if not looked after to at least some moderate extent, till at length no color at all can be depended upon. It is so with cats; their nocturnal and wandering habit make any systematic mating very difficult, and the consequence is that the kittens in a litter present colors which are often not found in either of the immediate parents; though there cannot be a doubt that were they bred with care, their produce would be quite as uniform as that of other animals; indeed such varieties of cats as from their greater value are bred with care—as the Persian or Maltese—do breed thus uniformly.

So much for what blood is *not*. Now for what it is. There is no recondite mystery about it; any man can understand it if he will try, and it is of great importance that he should understand it if he is ever to succeed as a breeder. I may briefly state it as follows: *Blood* in the sense in which breeders use the word—is *the certainty of reproducing*

any given point or feature in an animal, which—the certainty, not the feature—has been obtained *by selecting breeding stock for many generations presenting that feature*. The mere presence of the feature may be absolutely worthless in this connection or nearly so. What we mean is, that fixity of character by which we ensure that a bird or an animal shall breed progeny presenting certain definite points. Let us take for example the case of deaf ears. The natural color of these fowls is red, and in several breeds white ear lobes are considered a great blemish, as in Game or Asiatic fowls. Yet in every breed occasional birds are produced in which there is some slight trace of white in the deaf ear. This is what we might call an accidental variation. Now, if we take, say a Cochin hen which presents this undesired trace of white, and mate her with a red eared Cock, it is probable that in her progeny, there will be scarcely any with whitish ears. If we mate her with a Cock having the same trace of white, but still bred accidentally from a strain having no defined tendency to it, there will probably be rather more cases of the fault, but still not many, and the chickens free from it will have little tendency to 'throw it out' again in their progeny. But supposing that we select from the few chickens thus produced which do show the fault, a cockerel and pullet to breed together, we shall find the tendency greatly increased, perhaps to such an extent a third of the whole brood from this second generation will have whitish ears; and not only so, but amongst these will be one or two with whiter ears than the parents had. If we breed from these last again, the tendency will be increased enormously, not only more of the feature, but much more of the certainty we are speaking of being attained in every successive step, until after a while an ear *not* white will be as rare as the white ones originally were. So far as this one point of white ear is concerned, we shall now have obtained what we call 'blood'—the blood which tells in breeding. We mean that we can now *depend* upon fowls breeding white ears, so that, amongst hundreds of chickens there shall hardly be one that does not present it.

That we can thus depend I need not stop to prove. Every poultry fancier knows it—it is not at this stage that his difficulty lies. He knows that in his fowls there are some points that *hardly ever* vary, and which he never expects to vary; what he wants to know is *why other points* do. Does he breed Dark Brahmas? He finds his chickens come many splashed with brown, many streaked with white, some very dark, some very pale, etc., and he begins to think with your correspondent, that breeding birds to feather is more a matter of theory than achievement. His breeding cock is a beauty, so are his hens, but his chickens are anything but what they should be. He would like his pullets to be like their mother, but hardly any of them are, and he thinks it can't be done. But it can; and if I seem so absurdly simple, as I repeat so much here, it is because it is—just—here—that so many fail to see the reason of the failure. For let the fancier, thus disappointed, consider what I just now remarked, that while this troublesome plumage varies so, there are points in his birds which *do not vary*; for instance, he probably has not one, which does not possess the pea comb, or which is altogether destitute of feather in the legs. Why then are so many of his pullets destitute of breast pencilling, while the hens and a few of the pullets, alas! how few have it? Why does one vary more than the other? Many will see the reason directly, the question is thus stated, though they may not at once see all its consequences, and all will do well to think about it. I hope to enter more definitely into this part of the subject next month.

The Pintade, or Guinea Fowl.

A correspondent of the *Poultry Bulletin* writes:—"This much neglected fowl is a native of Africa, and it is presumed that they were called Guinea fowls on account of the first specimen having been brought from the Guinea coast of Africa. There are said to be a number of varieties, but all we have in this country are the pure white and the spotted. This bird always mates in pairs, so that if an excess of hens are kept, their eggs will prove unfertile. Their period of incubation is twenty-eight days, which often varies a day more or less. This fowl varies from all other varieties, in that the two sexes so much resemble each other that they are hard to distinguish apart. The Cock is a little larger than the Hen, and he runs with a mincing gait on tip-toe. His wattles are larger than his mate's, and he has his peculiar note or cry, which is entirely different from the hen, which can be readily distinguished by her constant cry of 'come back,' 'come back.' By their watchfulness and constant clamor, they are useful in protecting the poultry from hawks, for which alone they are worthy of a place in the poultry yard. The hen commences to lay about the middle of May, and will furnish a large number of eggs if not allowed to sit. She has her nest under bushes or in long grass, and it is generally very difficult to find. Some eggs must be left in the nest, and it must never be approached when the fowls are in sight, as the hen will abandon it as soon as the fact of its location is discovered. The first eggs should be taken and placed under common hens, and as soon as hatched chicken should be cooped, and the young kept from straying, by setting up some boards on edge, forming a little yard in front of the coop. Like turkeys, they require feeding, little and very often, for the first two or three weeks they should have a variety of nourishing food, such as hard boiled eggs, curds with onion tops cut up fine with a pair of scissors, and mixed through it, and bread crumbs, with clean, fresh water, three times a day. The hen should have whole corn, so that she won't rob the young ones. After two or three weeks they may have their liberty, and will do well on cracked corn or wheat. When feathered out well, before the hen leaves them, if they are driven to the chicken house every night for a week, they will get used to it, and will remain tame, and always roost in the poultry house with the other fowls, which is much to be preferred to having them wild, and roosting in trees. The Guinea hen on hatching her late eggs, may be left to herself, there being plenty of insects; then she will usually bring her brood through safely, and she will not stand being confined in a coop as well as common hens. The flesh of a young Guinea fowl is remarkably tender, and of exquisite flavor, much like that of the partridge. Their eggs are also very fine; and for beauty they are a great ornament to the poultry yard, and they should be bred more generally than they have been."

White Leghorn Fowls.

Wm. M. Lewis, author of the *People's Practical Poultry Book*, sends us the following as his experience with this breed. He says:—

We were repeatedly asked in 1870, and 1871, our opinion of White Leghorn fowls, as to their qualities for laying, hardiness, &c. Not at that time having had any experience with them, we could give no opinion, except from heresay.

In the summer of 1871 we procured one dozen eggs from J. Y. Bicknell, and set them, from which we reared six fowls—five cockerels and one pullet. We procured from the same gentleman two nice pullets. We then took the best young cockerel, and three pullets, and put them in a pen with a run-way attached, six by fourteen feet. We think the chickens were hatched the latter part of July, 1871. March 10th, 1872, we got our first egg from these pullets; from the 16th of the same month we received three eggs per day, and they continued to lay at that rate, with few exceptions, up to September 2nd, at which time they began to fall off. Some days we would get two, and other days three eggs. On the 8th of October they ceased laying altogether. The moulting season seemed to last them a very short time. They feathered up quickly, and showed no sign of weakness or sickness during the whole time. These three pullets have laid, by actual count:—

March 16th to 31st	48	eggs.
April	90	"
May	93	"
June	90	"
July	87	"
August	90	"
September	76	"
October	16	"
Total	590	"

In about 215 days these three pullets have laid 590 eggs. During the time, they have never shown any signs of being broody or sick, and we think not a day passed but what they ate their food with as much relish as they did the first day they commenced laying. We fed these fowls regularly twice a day—in the morning, at between seven and eight o'clock, and again in the afternoon, at three o'clock. They have always within their reach plenty of fresh water, the tank being filled every day; during the hot weather the tank is set in the shade.

Our feed is corn and screenings (mixed), barley and buckwheat (mixed), and once a week, a warm mash of corn-meal and potatoes, thoroughly cooked, and well peppered with either black or cayenne pepper. We generally, once a week, dig up the earth in the hen-yard, and give them a pile of coal-ashes to dust themselves in, and, occasionally give them a sheep's pluck; once or twice a month a few pieces of lime are thrown into the hen-yard. The nests are frequently dusted with sulphur, which is sure death to vermin.

We have reared but few Leghorn chicks during the past summer; but those that hatched have been perfectly healthy, and showed no signs of any disease whatever. We must say that we were much astonished at the rapidity with which the chicks feathered up. A gentleman visiting our yard during the past summer, and observing chicks six or eight weeks old, mistook them for yearling bantams, so fully were they feathered.

The above is our experience, in a small way, with White Leghorns, during the past season, and, from what we have heard, and learned by our own experience, we do not hesitate to say that they are a first-class breed as egg-producers, for hardiness of constitution, and as a table bird they nearly equal the flesh of the Dorking, though they do not breed to as great weight as do the Dorkings.—*Rural New Yorker*

To Manage Hen Manure.

Now that cold weather is approaching, and farmers shut up their hens more than in warmer weather, a few hints on the best way to manufacture hen guano, or compost, may be appropriate. The first thing is to provide proper reservoirs for the manure. Old barrels are just the thing, but strong dry-goods boxes will do. They will soon decay and be useless, unless protected with oil or gas tar. Coating them inside and out with light crude petroleum will fill the pores with the oil, and make them as good as cedar for durability; but if the contents are likely to be moist, gas tar inside will be better. The number of these barrels must correspond with the number of hens; there should be one for every ten hens. Then, if the weather is dry enough before freezing up to secure a quantity of road dust, fill all but one with the road dust, which is the very best absorbent you can get; and if dry, the barrels may stand anywhere under shelter without the freezing of the contents. If dry earth or dust cannot be obtained, the next best is finely pulverized soil, which will, of course, contain a good deal of moisture, and must be kept in barrels or boxes in the cellar, so as not to freeze. If you can procure a quantity of charcoal dust, it may be mixed with dry coal ashes, and the mixture will make a good absorbent. Dry saw-dust will do, but is not so good. When road dust or soil is used, the more clay it contains the better it will be as an absorbent, and the less in quantity will be needed.

Now, having the barrels all ready, the rest of the operation will be simple and easy. All you have to do is to place a stratum, say an inch or two, in the bottom of the one empty barrel, and then throw in the cleanings of the hen-house; then another stratum, and another layer of cleanings. The thinner each layer of the two is, the more perfectly they will become diffused together in standing. The precise quantity of each is not very essential—only you must have enough absorbent to hold all the volatile parts of the hen manure, of which you may usually judge by the odor, which may be corrected by adding more of the absorbent. Proceed in this way with each successive barrel. Next spring your barrels will be filled with a very powerful and most valuable manure.

You may add to its value by pounding and cracking up fine all the refuse bones you can find, by means of a stone-mason's hammer or an old axe-placing the bones to be broken on a solid flat stone, and encircling them with a wide hoop to keep them from flying off when struck. Sprinkle the fragments of bone among the layers of manure, which will cut and work them down. A part of the broken bones may be left for the hens to eat with their food, and these will be manufactured in a more perfect manner into bone guano.

By a little care and timely attention, you will secure a supply of manure, the value and quantity of which will surprise those who first make the trial. All you will have to do in the spring will be to pulverize and work over the mass, so as to be evenly and finely applied.—*Country Gentleman.*

THE PROFIT ON POULTRY.—Town Gent: "Now do you find keeping poultry answers?" Country Gent (lately retired): "O, 'es, s'posed to answer. Y' see there's the original cost of the fowls—'f course the food goes down to me, y' know. Well, then, I purchase the eggs from the children, and they eat them!!!"—*Punch.*

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The Canada Farmer.

TORONTO, CANADA, NOVEMBER 29, 1873.

The Twin Evils of Canadian Farming.

Every country has a husbandry peculiar to itself Its character becomes moulded and settled by a variety of circumstances, such as climate, the habits and wants of the people, markets, commercial advantages and the amount of general intelligence There must be a sort of adaptation about it, and in the study of what may be called the law of adaptations, the secret of success is to be found

The first characteristic of Canadian farming is to be found in the newness of the country, which forms its field of operation. No part of it can be said to be old, except by way of comparison with the sections that are still wild and uncleared There was a time, and that not very long since, when skilled husbandry and high farming had scarcely any scope or sphere in Canada Wheat drills, turnip sowers, artificial manures, and even that pioneer implement, the plough, were as much out of place as a dancing bear in a china shop. The axe, the ox-yoke, the logging-chain, the hand-spike, the cumbrous drag, the scythe, the cradle, the fork, the hand rake and the fanning mill, make up a pretty complete inventory of the farmer's outfit. It cost no large sum to set the backwoodsman up in tools and implements. These were days of primitive simplicity and hardship, illustrating how little man wants in certain positions, and how much he can do without

There are still parts of the country where a similar state of things prevails, but even in the newer townships, the time has come for different methods of procedure Timber is growing scarce and valuable, and it will not do to indulge in the wholesale slaughter of it, which was common in earlier days. The proximity of railroads with their freighting advantages, or of lakes and rivers with their floating facilities gives to the unbroken forest a value not possessed in the past, and dictates a conservative policy in its clearance. There are very few parts of the country now, where it will pay to log up and burn off the bush land It is being done in many instances, in which a slower process would be sounder economy, paying better in the end. In fact, the question begins to present itself, whether our national interests do not require a governmental inspectorship of woods and forests, with suitable regulations for the protection and preservation of our timber resources.

As the results of this having been a heavily wooded part of the world, the older sections of Canada have been cleared to bareness. The destruction of trees has been complete and unsparing. Out of this many evils have come. The landscape has a naked look, like the face of a man too much shaven; beard and whiskers all gone, and the countenance flanked with hair only back of the forehead. Fields and farmsteads are without shelter. There is nothing to break the force of the wintry wind, or the glare of the summer sun. At one season of the year, cattle roast, and at another they freeze, for want of the friendly shade of trees. The crops of the farm suffer, as well as the living beings that are on it. There seems little reason to doubt that the rainfall has been lessened, and that our now almost chronic droughts have been largely caused by this too thorough removal of the trees. Fall wheat, our choicest and best paying product, cannot be raised now in localities where once it was the chief pride and main dependence of the farmer. Last, but not least, scarcity of timber for fuel and for timber purposes, is beginning to be seriously felt, where once its plentifulness made it a nuisance and a drug.

Beneath the shade of the now obsolete forest, the early settler found a virgin soil of astonishing fertility. Its humus was the accumulation of ages. Not only had majestic trees been nourished by the rich leaf-mould, but it held a store of wealth for the coming farmer. That store of wealth has been wasted. No care has been taken to keep it as capital, and live out of the legitimate use of it. Most of our farmers have run a spend-thrift career. They have wasted their substance in riotous farming, and have cropped and cropped again with the most exhaustive products, until the land has failed from sheer exhaustion. We are not blind to the dire necessity that has driven multitudes to this mode of farming. "The destruction of the poor is their poverty." With their land to pay for, their families to keep, stock and implements to buy, it seemed to them that they could scarcely do otherwise. But ignorance as well as necessity has had much to do with the evil. A better knowledge of scientific agriculture, would have dictated smaller clearings; better tillage; more attention to stock raising; and the application of manure while the land was yet in good heart. Even admitting unavoidable necessity as a valid plea, it does not make the bad result less deplorable. A fire in a city may render the destruction of costly buildings necessary to arrest the progress of the flames, but it is a great pity and loss to have the buildings burnt up, notwithstanding. It may be necessary, when a ship is in danger, to throw part of a precious cargo overboard, but it is a misfortune to be obliged to make the sacrifice, nevertheless. And this exhaustion of a once fertile soil is a calamity, however it may have been brought about, and as such, cannot be too deeply regretted.

These two things, the nakedness of the land through neglect of tree culture, and its poverty from an exhaustive system of tillage, are the twin evils of Canadian agriculture. Manifestly, the line of improvement lies in their prompt redress. Care of the woods that flank the farm; the planting of parks, orchards, shrubberies, way-side shade-trees, and belts of evergreens; legislative and municipal regulations for the protection of forest and ornamental plantations, are among the plainest and readiest means to be used. Let our agricultural and horticultural societies give premiums for planting the largest number, greatest variety and best quality of trees. Let us make our homes cool in summer, warm in winter, and beautiful all the year round, with leafy bowers and evergreen walls Let us fence our grain-fields with live growths, and dot our pastures with maples, oaks and elms. We have unrivalled facilities for doing all that is needful and desirable in this direction. To remedy the second evil, we must grow root crops, raise and fatten stock, pay greater attention to dairying, invest more liberally in manure, take nothing from the soil without ample equivalent, and allow no fertilizing material to go to waste.

The Late Charles Stevenson.

Another prominent agricultural writer is dead. Charles Stevenson, for twenty-five years Editor of the *North British Agriculturist*, departed this life on the 19th ult., at his residence in Portobello, near Edinburgh, aged sixty-nine. The journal he conducted so long, and with such marked ability, contained, in its issue of the 22nd ult., a sketch of the deceased's life, to which we are indebted for the particulars here given.

Mr. Stevenson in early life showed considerable talent as an artist, and produced some landscape paintings which gave promise of future eminence in that line, had he cultivated the gifts nature had bestowed on him. But having resolved to devote himself to agriculture, he placed himself under the tuition of one of the best farmers in East Lothian, and in due time leased the estate of Redside. Here, he betook himself with great energy to the improvement of the lands he occupied, but as they unfortunately bordered on large game preserves, and he found it impossible to obtain any redress for the destruction resulting to his crops, he determined to do nothing more to add to the permanent value of the farm during the currency of his nineteen years' lease His own bitter experience of their injustice, made him an enemy to the game laws all the rest of his life. But he was a clear headed and liberal-souled man, and entered with much interest into every movement calculated to elevate the farm laborer, or to promote agriculture. He labored hard to expose the evils of hypothec, strenuously advocated tenant-right, sought the extinction of "bothies," and did all in his power to promote the erection of commodious farm dwellings, and comfortable homes for the working-classes. As Editor of the *North British Agriculturist*, he acquired an extensive and well-earned reputation for the soundness of his views on agricultural questions. Under his management, the journal just named has occupied a high place among our exchanges, and we cheerfully acknowledge not only our appreciation of it, but our indebtedness to it for much useful information, choice reading, and valuable clippings. Mr. Stevenson wrote an admirable essay on the farming of East Lothian, which appeared in the *Royal Agricultural Society's Journal* in 1853, and attracted much attention. He was a member of the Highland and Agricultural Society,—one of the founders of the Scottish Chamber of Agriculture,—a personal friend of the famous Baron Liebig, a juror in the Agricultural Department at the International Exhibition at Paris, in 1857, and an earnest advocate of experimental agricultural stations like those existing on the continent. He was a most upright, estimable, and kindly man, a little gruff and surly in manner, but like Dr Johnson, having nothing of the bear about him but the skin. Exemplary in private life, honorable and eminent as a journalist, a valuable and useful citizen, he has left a vacancy not easily filled. To quote a sentence or two from the *North British*:—"The tenantry of Scotland owe to Mr. Stevenson a deep debt of gratitude for his intelligent and effective writings, and for his clear, faithful and consistent support of the interests of practical agriculture. In the list of Scotsmen who have devoted themselves to the cause of agricultural progress, the name of Charles Stevenson deserves to stand next to that of Sir John Sinclair as a true patriot and benefactor."

A filthy pond or other foul place within 100 feet from where milk is set during Summer will spoil the butter.

The Transportation of Grain.

The *American Agriculturist* for November, has a lengthy article, profusely illustrated, in which a full and interesting account is given of the processes and expenses connected with the transportation of grain from the far west to the eastern seaboard. Engravings of elevators, canal-sections, tow-paths, grain-sifters, hoppers, aisles, &c., make the information given very intelligible, and cannot fail to attract the attention of the dullest and youngest readers of that useful journal.

We refer to the article in question mainly because it has an important bearing on the agitation going on among the farmers of the Western States for cheaper transportation of produce; and because it shows in a very forcible manner (by implication, for it is not even suggested), the great advantages connected with the water communication we possess.

It appears that, notwithstanding the immense carrying capabilities of the great trunk lines of railway running from East to West, a very large proportion of grain finds its way to the seaboard by water. The *Agriculturist* says, the value of the Erie Canal to the Western farmers is very much under-estimated. It affirms that "on it their existence mainly depends;" and that "without it their vast crops would lie rotting in the fields." These are strong statements, but they are verified as follows :—

"If the present railroads were more than doubled they could not take the whole grain shipped eastward. Since its opening, twenty-three years ago, the Erie Canal has carried nearly 120 millions of tons of freight, which is nearly double the amount of the whole tonnage of all the vessels from foreign countries which have entered New York in the same period, and is nearly three-fourths of all the foreign tonnage entering all United States ports in that time. The canals of New York are on the whole 900 miles in length, and the railroads are four times as long; yet in 1872, the canals, in 7½ months of navigation, carried 48 per cent. of the whole freight passing through the State, while the railroads in 12 months carried 52 per cent. What the West would do then without the canals of the State of New York is very difficult to imagine, and these facts open up a matter for consideration which is of the greatest importance at this time, when this vast question of transportation is under discussion."

One canal-boat is stated to be equal in carrying capacity to a train of twenty cars, and the voyage on the Erie Canal usually takes about three weeks. Long as this period seems in these days of rapid transit, it would appear that when business crowds upon the railway lines, the progress of grain is no faster, owing to a variety of delays before and after starting car-loads of grain. The cost of passing grain through the Chicago elevators is 3½ cents per bushel. Freight from Chicago to Buffalo is 15 cents a bushel for wheat or corn. The transfer from vessels to canal boats at Buffalo costs 1¼ cents more; and then the grain is sent on its winding way to New York at a charge of 12½ cents per bushel more, making in all 32½ cents from the great mart of the West to the great port of the East. Let the short Welland Canal be enlarged to admit the passage of ocean vessels, or let the much-talked-of Georgian Bay Ship Canal be constructed, and the carrying-trade of the great West is ours to a dead certainty, because our merchant marine could out-distance all competition. The trifling cost of shipment at Chicago, would leave 29 cents to the good for freightage as between that city and Montreal, while grain could be landed at Liverpool and other ports in the Old World before it could reach New York, either by railroad or canal through the territory of the United States. How plainly all this points to the policy of improving our water ways, and how infallibly it foreshadows the great future which is before this country as the commercial highway between Western America and Europe. If the much-discussed enlargement of the Erie Canal were practicable, which it appears it is not, or the Utopian scheme of heating its waters by means of steam-pipes, in order to render them navigable all winter, were suddenly to become feasible, our paramount advantages would hardly be abated a single jot or tittle, for the margin of cost would still be so largely in our favor as to leave us masters of the situation. And through all the brilliant future of Canadian history, if we make it what it can and ought to be made, our farmers will have the advantage on their side; and it is by no means trifling, of a comparative nearness to the seaboard, which will always give them enough more per bushel for their grain materially to augment the profits of their business. Contentment with our lot, diligent improvement of our opportunities, and faith in our "manifest destiny," very plainly rank among the duties we owe to our country, our world, and our age.

Value of Pea Straw as Fodder.

A correspondent asks what is the value of pea-straw as fodder when compared with oat or wheat-straw? The answer must be,—"That depends." Pea-straw may be very poor or very good fodder. The difference results mainly from the manner of curing. If peas are allowed to go dead ripe, and after pulling are exposed an indefinite length of time to rain and all sorts of weather, the haulm will be tough, tasteless, and innutritious, but if pulled in season, before the peas are quite hard, and got into the barn speedily, without needless or long exposure to sun and rain, the straw will be bright in color, tender in fibre, and fully as valuable as any other kind of straw. Perhaps there is no crop more neglected in the harvesting of it than peas. Because the grain is not so apt to suffer from the weather as oats or wheat, it is often left out so long that the haulm becomes comparatively worthless. It pays to economize all kinds of straw, and it should be a maxim on the farm to permit nothing to go to waste that can be turned to profitable account. If possible, all straw should be housed, and it is good policy to chaff it with a cutting-box. One driven by horse-power will be found to accomplish a large amount of work in a short time, and will effect a great saving of food. In winter, when teams have little to do, it is easy to keep up a good supply of cut straw, which fed with turnips or meal, will be eaten with great relish by stock. Eke out the fodder supply wonderfully, and be a great help to the manure heap. Some think well cured pea-straw more valuable than any other. It is rich in nitrogen, and is said to give the best results when a small proportion of corn is fed along with it. On such a diet, we believe sheep will fatten remarkably well. A good farmer of our acquaintance, considers the straw of a first-rate crop of peas, well cured, nearly as valuable as clover hay.

N. Y. State Dairymen.—This Association has issued the programme of its third annual convention, to be held at Sinclairville, Chautauqua Co., Dec. 10th and 11th. Papers or addresses are expected from the president, Mr. X. A. Willard, from Hon. Harris Lewis, Herkimer; Mr. J. Wickson, Utica; L. B. Arnold, Ithaca, Hon J. Stanton Gould, Hudson; E. W. Stewart, Buffalo; Gov. Seymour, Utica; Anson Bartlett of Ohio, and others. As usual these addresses will be followed by general discussion.

Colored Fairs.—*Turf Field and Farm* says Through the medium of agricultural fairs, the blacks of the state, of Kentucky at least, are being educated to take a warm interest in the prosperity and the material growth of the respective local communities in which they live. They have entered the lists of competition, and are there stimulated to strive at excellence in all kinds of handiwork, and are taught the importance of leading lives of sobriety and industry. They take great pride in their annual exhibitions. At Lexington, the very centre of Kentucky aristocracy, and the home of white wealth and culture, the blacks own a beautiful tract of land which they have converted into a fair ground. The place is well improved, and it always presents a neat and striking appearance to those who view it from their carriage windows driving along the public highway.

Agricultural Intelligence.

The Scotch Crops.

The past summer has brought with it its anxieties to the tillers of the ground, for the season has been wet, variable and cold. In all parts of Scotland the first three weeks of September were excessively wet, at the very time when the vast portion of the grain crops were exposed in stook—indeed, in the North-eastern counties it was the wettest September that has occurred for 30 years. In Kincardineshire, the rainfall measured six inches, which, with the two preceding months, amounted to a total of 14 inches. Heavy floods occurred in Forfarshire and adjacent places on the 14th ult., which more or less damaged the crops, and entailed serious losses in low-lying grounds near the sweep of rivers which were roaring in full flood. Again, the South western parts suffered considerably from a deluge of rain in the beginning of October, and the late outstanding crops were perfectly soaked. In the shires of Roxburgh and Dumfries 11 inches of rain fell during the past three months. The hay harvest was unpropitious, protracted, and expensive, as well as the reaping time of the corn. In the South-western part of Scotland, where a great breadth of hay is grown, the rains of July amounted to six or seven inches. In Ayrshire, which has been long famous for ryegrass seed, the husbandman, with all the appliances usually had recourse to, to counteract the effects of a dripping climate, was unable to save it without scath. The coarse hay of the irrigated meadow, which is so much of a feature in the semi pastoral districts of the West, was also severely drenched. The latter is a heavy crop, and it required every effort to get it carried before the commencement of the corn harvest. The clover and ryegrass hays are a light crop, and command fully the usual prices. The former remark applies to almost every county in Scotland, and prices range from 1ld to 1s per stone of 22 Imperial pounds, the 159 stones being received as a ton weight.

The oat and barley crops are very fair, and a full average. The former is the best crop, and covers by far the largest area, for barley is seldom grown in wet districts, and its cultivation is not carried to a great altitude above the ocean's level. Oats also prove of a good mealing quality, which is not sensibly impaired by the rains. But barley on the other hand has suffered a good deal in color and malting quality—in some cases as much as 4s and 5s per qr. The Lothian barleys command fully 50s per qr., and the growth of Fife and Forfar 30s to 38s. There was a comparatively small breadth of wheat grown last year, and it was the lightest of the cereal crops—being thin on the ground, rather late in coming to maturity, and rarely assuming the golden color. The price of wheat compared with barley, does not conduce to its extended cultivation, even on what is esteemed good wheat lands. From their susceptibility to stain from rains and muggy weather, white wheats are gradually giving place to red and yellow varieties. Scotch farmers are on the whole in better spirits than they have been at the corresponding period for several years. The rickyards are pretty full; the damage from the rains is not material, and not at all what was at one time feared. Sharp drying winds now and again occurred, when the weather was at the worst, and dissipated the moisture that drenched the sheaves. The oats in upland places were later than ordinary in coming to maturity, compared with the fields on low-lying plains, and thus the quality of the kernels were not sensibly impaired. But while the northern farmer expresses satisfaction with the present crop, the remembrance of the disastrous harvest of last year, with its heavy losses will not be soon forgot. With the high rents now exacted and the heavy labor bill, he does not calculate that this crop will do more than clear current obligations, and far less recover last and preceding years' arrears.

Potatoes before the advent of September were universally reported a full and fine crop, but from no district are they now reported free of taint. A Dumfriesshire farmer thinks that two tons per acre will be all the return In Kirkcudbright, again, they are said to be one-third diseased. The reports are better northwards, and as the crop was originally very large, it may be hoped that a considerable surplus will continue unscathed. In the Arbroath and Dundee districts large quantities of potatoes are grown annually; and the average produce is reckoned 6 tons per acre; last year such was the virulence of the disease that no more than 25 cwt remained on an acre after the disease had run its course. This season they were unusually promising, but when we left that part of Scotland, a fortnight ago, some farmers whom

we thought were taking a rather desponding view of the crop, were of opinion that not more than half of the crop would remain. A full crop in these potato-growing districts commonly sells for twenty-four or twenty-five pounds. South of the Tay, in Fifeshire the potato-crop has given way very much; at a recent date they were very promising, and the Fife farmers were flattering themselves that the foreigners would not get a footing in our markets.

Turnips are the finest and heaviest crop that has been grown for years, if those on wet and heavy lands are excepted. Fattening cattle were put up a month ago, and the Aberdonians are flattering themselves that they will again be able to hold their own against all England. Pastures are deficient in most counties, north and south, and graziers who have not succeeded in finishing off their bullocks on the grass will not obtain much for summering. The prices of lambs and sheep have declined considerably, and trade is in an inanimate state in the south of Scotland; but while the best mutton is quoted at 9½d and 10d per pound in the Edinburgh and Glasgow markets, flock-masters may rely on obtaining respectable prices for their sheep from the feeders, whatever decline there may be from recent values. The great autumn fairs for the sale of the aged black-faced sheep of the Grampians took place this month in the central district of Scotland, and, however prices may rule, the store-masters are confident that they will obtain last year's prices, for they have no experience of reduced rates with a general fine crop of turnips. Their reasoning is based on the fact that it is common for farmers to retain a certain quantity of turnips for cattle, and to consume the balance with sheep, so when there is no surplus there are no turnips for sheep.—*Bell's Messenger, Oct. 20th, 1873.*

"Big Wages" in America.

The American correspondent of the *Irish Times* says:—The "peculiarities" of American money, and what it can purchase, make people believe that there is nothing to do but come to the United States and get rich, when they hear of what wages can be earned here. I want now to give facts—hard facts—as to wages here, and what the same are really worth. Laborers—and the great bulk of Irish emigrants become merely unskilled laborers here—can get from 1 dol. 75 cents to 2 dols. a day. I was speaking last week to a gang of Irishmen, who were putting down a stone "bahast" on a great leaning railway, about their wages. They had a certain amount of skill in their work. They told me that their wages were just 1 dol. 50 cents a-day—never more. Now if this be read as 6s. a week, for laborers on a railway, of course it looks big wages. But it is 36s. a week in "greenbacks," and what will the amount purchase for the laborer and his family? Everything, all round, is dealt with in the same expanded currency, and everywhere you turn you have to pay just in the same style for every article you purchase. A working man could get a good pair of strong boots or shoes in Ireland out of which he could take from six to nine month's wear, with some repairs, for from 7s.6d. to 10s. Here he will pay six dollars (24s.) for a pair that will hardly keep his feet dry at the very first, and will not wear over three months at the very best. He must buy three pairs here for one pair at home. Just take my own experience by way of illustration. In Dublin I have worn several pairs of boots, one after the other, at 14s. a pair. I brought one pair of them out to the United States now. I wore those here for over twelve months, with a pair of soles on them as the only repairs. I bought a pair in Nassau Street, New York, for 8 dols., which only lasted three months. It would take four pairs of them to wear me as long as one pair I could get in Dublin, and at 8 dols. a pair, 32s., instead of 14s. a pair, four pairs would be 128s. or £6 8s., for boots for a year here, instead of 14s. in Dublin. I leave cost of repairs out in both cases. I have a *cotamore* made in Dublin, which cost me £3 6s, about 16 dols. I was offered 65 dols for it here, after wearing it three winters. A hat that I could buy in Dublin for 12s 6d will cost me here 7 dols. to 8 dols., 28s. to 32s. I have worn good suits of tweed in Dublin, costing from £3 5s. to £3 15s. Anything nearly as good here will cost from thirty dollars to forty dollars, £6 to £8. House rent, owing, of course, to the very high wages for all labor on the building, and to the heavy taxation of the cities, is enormously high. Working men earning 1 dol 50 cents to 2 dols. a day cannot get two rooms, and only pockets, for less than 10 dols. a month, in advance, in the poorest and lowest slum of our American cities. Any decent place would be 15 dols to 20 dols a month. Any man like a foreman cutter in a tailoring establishment, a draper's assistant, a grocer's assistant and men of their class, could not get any place to rent that they would let it be known they lived in for less than 40 dollars to 50 dollars a month. And this, too, at such distance from their business as to involve street car-fares, tramway fares to and fro every day, which makes an additional rent. It will thus be seen that all the talk about "high wages" received here is absurd. If those who write home about the wages would only just tell the expense of living here, then a better idea could be formed of the disadvantages of American life. The cost of clothing women and children is even greater than that of clothing men. A man in many cases may wear what he pleases in America. But the women! They must dress. Every woman dresses out of all proportion to the means at her disposal, except in one case in a thousand. It is a fearful thing for a working man here to keep their wives and daughters "dressed in the fashion." Dressmakers charge 8 dollars for making a plain dress for a servant girl—42s. for making it alone. It takes 20 yards now to cover a middling-sized woman; but at one dollar a yard, for anything fit to be seen, it comes to 20 dollars, and 8 dollars for making it, and 2 dollars for trimming, a plain dress for a servant girl will thus cost 30 dollars—£6. What is the use in "Biddy" writing home to Ireland that she has 12 dollars a month, or 15 dollars a month, and her board, when it takes 30 dollars to put one dress on her that she can take out to be seen at mass on Sunday morning? Everything else costs her equally high. There is nothing to be made by these nominally high wages. The whole thing is a bloated bubble—a sham, humbug and fraud.

Recent Sales of Stock.

We are indebted to the *Country Gentleman* for the following reports:—

A number of important Sales of Horses have lately been held in Kentucky, the results of some of which we epitomize below. Col R. West, Edge Hill Stud Farm, held a sale, Oct. 29th, which brought the following returns:

9 colts and geldings, average $[illegible]	Total	.....	$2,540
16 mares and fillies, do [illegible]	do	.....	4,870
18 brood mares, do 291	do	.....	5,060
43 head average $[illegible]	Total	.....	$12,970

Dr L. Hunt sold at Locust Park, near Lexington, Oct. 28th, 41 head of trotting stock, of various ages and both sexes—a large part of them the get of Mambrino Patchen—for which $10,105 was realized, being an average of $246.60 each.

Mr. R. E. Coleman sold at Lexington, Oct. 31st, 26 head of trotters (including Ben Bruce for $1,377) for an aggregate as below:

11 stallions, average $329	Total	.....	$3,625
2 brood mares 167	do.	.....	335
13 mares and fillies 204	do	.....	2,655
26 head average $[illegible]	Total	.....	$6,495

Gen A. Pennington sold at Peach Blossom Farm, Oct 30th, 20 head (including Billy Holmwood by Lexington for $1,225), realizing in all $8,930, or an average of $446 50 on each. Many of them were foals of 1871, '72 and '73.

We observe reports of several sales in the *National Live Stock Journal*, which may be abbreviated as follows:—W. F. Gordon of Liberty, Mo., carried a number of Short-horns to California, exhibited them at the State Fair and sold them at auction at Sacramento, Sept. 20th, with the following results:

6 cows and heifers, average $391 00	Total	.....	$2,345
14 bulls and b. calves, do. 271.00	do.	.....	3,800
20 head, average $307 25	Total	.....	$6,145

R. M. Sparks, Marysville, Cal., sold ten Short-horns the same day.

6 cows and heifers, average $261 00	Total	.....	$1,565
4 bulls and b. calves, do. 142.00	do.	.....	570
10 head, average..... $213.50	Total	.....	$2,135

N. Chaffee & Son, Pottawatomie County, Kansas, sold thirty-one head, Oct. 8th.

19 cows and heifers, average $175 00	Total	.....	$3,330
12 bulls and b. calves, do 176 00	do.	.....	2,115
31 head, average..... $178.74	Total	.....	$5,445

A Sale of Berkshires and Cotswolds was held by the Glen Flora Association, Waukegan, Ill., Oct 15th. One hundred and twenty-four swine, including boars and sows, young and old, but not counting the litters sold in two cases with their dams, were sold for $2,743 50—an average of a little over $22 each, which, all things considered, was satisfactory. The Cotswolds offered aggregated, young and old, 169 head, and included a fine imported ram and four pairs of fine imported ewes, which brought good prices. The 169 head brought $4,245.50—an average of something more than $25.

Scottish Agrioulture in the Seventeenth Century.

The following historical fragment, from a sketch given in a recent Edinburgh paper, of the kind of farming in vogue in North Britain two hundred years ago, will show in a forcible manner what two centuries have done in the way of progress and improvement:—

"In the central and more lowland parts of the country, ploughing was affected by means of a huge, roughly-constructed implement, mostly of wood, and drawn by teams of from 4 to 6 oxen and cows in each. Cumbrous and unwieldy such a team must have been. What would the agriculturists of the present day think of a procession of a dozen bullocks and cows, yoked pair and pair abreast to one rickety wooden plough, driven by four or five men, with "hazel rungs" in hand, and turning a furrow only two or three inches deep? The ridges were narrow and crooked. No "end rigs" were ploughed, there being ample room on the adjoining marshes to turn even a monster team of this sort. The harness consisted almost entirely of plaited straw and rope, leather being a comparative novelty. The collar was simply a twined straw rope termed a "brechum." In many cases "hames" were not used, the traces being fastened to the collar. The "hames" were made of two pieces of badly-manufactured wood, tied at each end by a rope, another portion of which, knotted into halter form, served as a bridle. Traces were manufactured from hemp. The plough had a long heavy beam of wood, and stilts of the same material. The improved ones had an iron mould-board and sock, neither of which was, however, calculated to secure efficient cultivation. The bluntness of the plough, and the tough, wild state of most of the land, required a greater draught than ploughing a similar depth would necessitate now-a-days. Still, with so many animals, the work must have been light. The tackle for one thing would not have borne a heavy draught, nor indeed would the cattle, the animals being rather small, and imperfectly fed. The post of driver was one which told very severely on the lungs, the bawling at the cattle being loud and almost continuous. When an earth-fast stone—and of these there were many—happened to unseat the plough, a catch in the soil was regained as soon as possible, but no care was bestowed to turn over the portion thus missed, which was termed a "bauk," and occasioned a blank in harvest.

The process of harrowing was almost a farce, the covering of the seed being more the desideratum than the acquirement of a good tilth. In the Highlands a pronged hand article, something akin to a grip, buried the grain, while in the central districts the harrows in operation barely deserved the name. The frame was of rough wood, clumsily jointed, and pins of the same material occasionally officiated as tines. Many considered rolling unnecessary or rather never gave it a thought. Others by-and-by rolled their crop almost as punctually as they sowed it. But with what? Not a finely finished stone or wooden roller in a high frame, but with a short rounded stone in a low-set semicircular frame, to which the traces were attached. It is stated that some of the Highlanders at one time actually fastened the harrows by means of ropes to the tails of their "garrons"—i. e., their hardy, untractable ponies, and in this ludicrous fashion harrowed the land, leading the horses by the mane in certain instances, while rope halters were attached to others. It is on record that in Ireland an act of Parliament was passed in 1634, making such hideous practices penal. When horses could not be got in tackle, men, by means of ropes thrown over their shoulders, dragged the harrows."

Prize Farms.

Large Farms.

Mr. Andrew Price's, Bagley:—This farm consists of 278 acres. The soil is of varied character, consisting of clay, and sandy loam, all of which is in the highest state of modern cultivation. The meadows and pastures, which a few years ago were nearly approaching bogs, are now by drainage and dressings of burnt peat (nearly all done at the expense of the tenant), producing hay and grass of moderate quality, in large quantities. The arable land is in a very clean and superior state of cultivation, as the stubbles and stack-yard show. The fences were also laid down by the tenant, and very enlarged fields are kept in very good order. Turnips and mangolds, 46 acres, are first-class, clean, and well managed. The house and farm buildings are suitable, and in good repair. The dairy is a specimen of perfect management, under the direct superintendence

of Mrs. Price. The two other farms exhibited under the head of large holdings, viz. : Mr. Nevett's, of Yorton-Villa, and Mr. John Carrick's, of Pendalog, deserve the highest commendation of the judges ; the former for extremely good management generally, and the latter for having for a number of years struggled against and overcome difficulties on what originally must have been to a great extent open hill land, but is now by cultivation and intelligent management a perfect specimen of good farming.

Small Farms.

Mr. William Griffith's, Chirk :—This farm consists of 142 acres of strong, sandy loam, of a good character, the larger proportion of which is arable. Everything on this farm shows superior and intelligent management. The corn crops, as shown by the stubbles (very clean) and the stackyard (extremely neat and full) are first-class. The turnip and mangolds, 20 acres, very good. The well-managed fences are in first rate order, and the whole of the holding is in a highly-creditable and satisfactory condition. The tenant combines with the farm the occupations of innkeeper and butcher, and all the necessary appliances for these occupations are ample and satisfactory. The other farm exhibited under the head of small holdings, occupied Mr. W. W Wynn Loyd, The Hayes, deserves the especial approval of the judges. The pasture land on this farm is of a very superior class, and larger in proportion than the arable, which latter is a clayey loam. The house is a perfect gem, with pleasure grounds and gardens laid out with great taste and beauty. The farm buildings, which are detached, are in good repair and extensive enough for the occupation.

The judges cannot close their report without referring with all due respect to a subject more directly referring to the landowners of the district over which their inspection extended, viz., "hedge-row timber.' They feel confident that if gentlemen fully estimated the damage inflicted on the country generally, and their own tenantry in particular, by the overgrowth of trees in hedges surrounding arable land, they would at once decide on abating the nuisance. With reference to oak timber at distant intervals, they do not complain, as these are less hurtful than others ; but ash, elm, poplar, alder, and beech are most injurious, and as an instance they would note the farm of Mr. Samuel Dicken, of Nesscliffe, where, of two fields of turnips and mangolds there cannot be less than two acres entirely destroyed by worthless timber, and they very respectfully submit the above remarks to the landed proprietors.—(*Report of the Judges on Farms for the Oswestry Agricultural Show, September, 1873.*)

The Duchesses.

A letter from Mr. Simon Beattie, dated Pickering, Canada, Nov. 1st, contains the following notes : "I have just returned from Quebec, having shipped in good order eight head of cattle for England, including Lord Bective's three Duchesses, Mr. Holford's Duchess, one Oxford, and two Wild Eyes, and I also sent in their company a Red Rose bull. Tenth Duchess of Geneva was looking blooming, and having seen most of the Duchesses in this country and in England, I think her the best Duchess that stands on four legs in this or any other country, and that as an animal second to her, is Duchess 97th, that I landed for Lord Dunmore this Summer. In them there is more substance, more life and vigor, than in any of the family I ever saw of late years. When I had the pleasure of selecting 97th as a one-year old, for Hon. M. H. Cochrane, I was satisfied that she was an animal of good constitution ; and such was the case, as she stood both her Atlantic trips well, and when I last saw her grazing in Lord Dunmore's park, in August, she was looking as blooming and as fresh as ever. She was a grazer, a breeder, and a milker ; her early aptitude to fatten, putting on firm flesh, and on the right place, was wonderful. I well remember a remark from Lord Dunmore, as I was passing through his park and taking my farewell look of her—'Beattie, there is some reality in her ; she is really a fine animal.' "—*Country Gentleman.*

The London *Mark Lane Express* says :—Every day's reports make our dependance upon the potato less, for the accounts received show a great increase of the disease, and diminished growth of 529,395 acres. We cannot thus overlook that more substantial substitute, maize, as a much better *dernier resort* and we hope the price will be sufficiently high in America to prevent its consumption for fuel, which has been common there.

Bursting of an Irish Bog.

A correspondent writes to the *Times* —"I have just returned from inspecting one of the most pitiful scenes of the sort it has been my fate to witness since I saw the remains of the village of Visp, in the Rhone Valley, Switzerland, after its destruction by flood some years ago, and I think a short account of it may be of interest to some of your readers. The scene to which I refer is the result of the bursting of a bog, situated about three miles east of the town of Dunmore, in the northern part of this County (Galway). Heretofore this bog was connected with the Dunmore River, at Dunmore, by a small stream called the Corrabel River, flowing through a continuation of pasture and tillage lands in its course. The level of the upper surface of the bog was formerly 260 feet above the sea, and that of the water at Dunmore 190 feet—showing a fall of 70 feet. Up to a fortnight ago this bog presented the usual appearance of most of our undrained Irish bogs—*i. e.*, its skirts, adjoining the arable land, consisting of high turf banks, its centre being exceedingly wet and spongy. On Wednesday, the 1st instant, the farmer occupying a farm on the Corrabel stream, nearest the bog, was digging his potatoes, when he suddenly observed a brown mass slowly approaching him. He left his spade in the ground and went for the neighbors ; on his return the mass (which was the moving bog) had half covered his potato field, and completely hidden from sight his field of corn, with the exception of a few "stooks," situated on a knoll ; they still remain an island in the middle of a scene of desolation. This was but the commencement ; since then the bog has continued to advance in a rolling mass, continuing its course right down the valley to Dunmore, burying on its way three farm-houses, and covering at least 150 acres of pasture and arable land to a depth, in some places, of six feet. The unfortunate occupiers of the three farms have been turned, by this visitation of Providence, farmless and homeless, with their families, on the world. At Dunmore a small bridge has been removed, near the junction of the Corrabel stream with the Dunmore River, to afford relief to the lands up the valley, and a bog-laden torrent is being discharged into the latter river. The worst may be said to be over, but the discharging powers of that river will be materially affected by this influx of solid matter. The source of this disaster presented a wonderful appearance."

THE WESTERN WHEAT CROP.—Messrs. William McLaren & Co,, of Chicago, make the following estimate of the wheat product of the North-west crops 1872-73.—Actual facts and careful estimates of the crop of 1872, for the States of Wisconsin, Illinois, Iowa, and Minnesota, show the disposition of it to have been as follows :—

		Bushels.
Receipts of wheat, and flour reduced to wheat, at Milwaukee, Aug. 20, 1872, to Aug. 20, 1873, were		26,969,339
Receipts of wheat, and flour reduced to wheat, at Chicago, Aug. 1, 1872, to Aug 1, 1873, were		26,028,612
Receipts of wheat, and flour reduced to wheat, at Duluth, St. Louis, and other points, (from the four States named) Aug. 20, 1872, to Aug 20, 1873, estimated)		5,500,000
Consumption of the four States (estimated)		20,409,550
Seed on estimated average, 6,166,199 acres, at 1½ bush. per acre		9,204,248
Total crop of 1872 disposed of		93,511,749
In estimating the crop of 1873, in the four States named, we take as a basis, the crop of 1872		93,511,749
Add for increased product per acre, increased average, and old wheat left over from previous crop, in all equal to 25 per cent. increase		23,377,938
Estimated total product, 1873		116,889,687
Consumption of the four States, based on 4½ bush. per capita of population (census 1870), with 25 per cent. increase added	28,771,250	
Required for seed, on basis actual average, 1872-3 (with 15 per cent. added for 1873-4), at 1½ bush per acre	10,584,660	
		39,355,850
Available for export from the northwest, season, 1873-4		77,533,837
Of this there has already been moved, as follows :		
Receipts of wheat, and flour reduced to wheat, at Milwaukee, Aug. 20 to Oct. 15, 1873	8,971,240	
Receipts of wheat, and flour reduced to wheat, at Chicago, 1st Aug. to Oct. 15, 1873	11,760,874	
Estimated out movement via Duluth, St. Louis and other points, Aug 10 to Oct. 15, 1873	8,000,000	
		28,732,114
Remaining in farmers' hands, available for shipment from the northwest		68,801,723

Breeder and Grazier.

The General Principles of Breeding.

In selecting a sire and dam for breeding purposes, the dam is most to be considered, for many reasons, one being that she usually continues the property of the breeder, while the sire can be changed each time she breeds ; but the chief argument in her favor being founded upon the supposition that she really impresses her formation upon progeny more than the sire. This, however, is a vexed question in natural history, as well as in practical breeding, but we are strongly of opinion that it is true. Many horses may be instanced, which have got good stocks from all sorts of mares ; but in opposition to this may be instanced the numbers which have had enormous opportunities of showing their good qualities, but while they have succeeded with one or two, have failed with the larger proportion of their harems. So with mares, some have produced, every year of their breeding lives, a splendid example of their respective kinds, altogether independent of the horse which may be the parent, so long as he is of the proper strain likely to hit with hers.

It is usually supposed that the sire impresses his external formation upon his stock, while the dam's nervous temperament is handed down ; and very likely there is some truth in the hypothesis. Yet it is clear that not only does the sire and dam affect the progeny, but also the grandams and grandsires on both sides, and still further than this, up to the sixth, and, perhaps, even the seventh generations, but more especially on the dam's side, through the grandam, great-graudam, &c.

There is a remarkable fact connected with breeding which should be generally known, which is, that there is a tendency in the produce to a separation between the different strains of which it is composed; so that a colt composed in four equal proportions of breeds represented by A, B, C, and D, will not represent all in equal proportions, but will resemble one much more than the others, and this is still more clear in relation to the next step backwards, when there is eight progenitors. In the same way color, and particular marks will be changed or obliterated for one, two, or even three generations, and will then reappear. These facts are very remarkable, as showing the tendency to "throw back" for generations, but, as they are well known and recognized by all breeders, it is unnecessary to dilate upon them.

But it may be asked : What are the principles upon which breeding is to be conducted. To this, in many of the details, no answer can be given which can be relied on with certainty. Nevertheless, there are certain broad landmarks established, which afford some assistance, and these shall be given, taking care to avoid all rules which are not clearly established by general consent.

a. The male and female each furnish their quota towards the original germ of the offspring ; but the female over and above this nourishes it till it is born, and, consequently, may be supposed to have more influence upon its formation than the male.

b. Natural conformation is transmitted by both parents as a general law, and likewise any acquired or accidental variation. It may, therefore, be said that, on both sides, "Like produces like."

c. In proportion to the purity of the breed, it will be transmitted unchanged to the offspring. Thus a mare of pure blood put to a scrub male, will produce a colt more nearly resembling her shape than that of the father.

d. Breeding in-and-in is not injurious, if not persisted in without proper judgment, which may be proved both from theory and practice.

e. As every animal is a compound animal, made up of a sire and dam, and also their sires and dams, &c., &c., so, unless there is much breeding in-and-in, it may be said that it is impossible to foretell with absolute certainty what particular result will be elicited.

f. The first impregnation appears to produce some effect upon the next and subsequent ones. It is therefore necessary to take care that the effect of the cross in question is not neutralized by a prior and bad impregnation.

By these general laws on the subject of breeding, we must be guided by the selection of the male and female, from which the offspring is to be obtained, always taking care that both are, as far as possible, remarkable, not only for the bodily shape, but for the qualities of the brain and nervous system which

are desired. If these points are not attended to, the result is not often good. To secure these several results, the pedigrees of the male and female are carefully scanned by those who are particular in these matters, because then assurance is given that the ancestors, as far as they can be traced, possessed all those qualifications, without which their owners would not, in all human probability, retain them. The importance of pedigree is becoming more fully recognized every year, and experienced breeders generally refuse to have anything to do with either male or female for this particular purpose, unless they can trace the pedigree to ancestors belonging to parties who were known to be themselves careful in their selections. Without such care, the reproduction of a particular shape and make cannot, with anything like certainty, be depended on

Crossing is practised with two distinct objects in view :—1st, To prevent degeneration in consequence of keeping to the same blood, or what is called in-and-in breeding; and 2nd, With a view of improving particular breeds when they are deficient in any desirable quality, by crossing with others which have it in perfection, or often in excess.

Among horses, certain varieties are remarkable for particular qualities, such as speed, stoutness, courage, temper, and shape (which includes action). Now it happens that there are certain old strains which have some of these qualities developed in a very high degree, but are deficient in others, and, therefore, they are only adapted to those breeds in which the qualities they are deficient in are in excess.

It is by a knowledge of these properties, and by taking advantage of them, that our modern breeds have been brought to the perfection at which they have arrived; carefully combining the plan with the principle of selection which is the great secret in all kinds of breeding.—*Prairie Farmer.*

How to Use a Ram.

The season of the year is at hand when owners of good flocks of sheep begin to think about putting the rams with the ewes. Some, who are close to good markets, and have warm sheds or stables for their ewes, will want to put in the rams in September, so as to have their lambs drop in February. Others, who live farther from market, and have no conveniences for early lambs, will put off the matter until November. Where the breeder makes a business of selling lambs to the butcher, the earlier the lambs are dropped, the more valuable they are. In such a case, the object of the breeder is (or should be), to have the lambs strong, vigorous and healthy, so that they will need scarcely any looking after, but will be on their feet in a few minutes after being dropped, and grow right along until ready for market. This matter is almost entirely under the control of the breeder, and depends principally on the ram and his management. He should be short legged, square-built, with a vigorous constitution, free from any vital defect, a hearty eater and willing to stand up for himself—i. e., a good fighter. Some object to this last requisite; but other things being equal, the limbs of a fighting ram will be found to be heartier and livelier than those got by a ram that is easily driven.

No ram of less than two years should be used to any considerable number of ewes. The get of a younger ram are sometimes weak when first dropped.

The ewes should be put into a pen or stable once or twice a day, and the ram let in among them He will soon learn to hunt a flock over thoroughly for ewes that are in heat. Only one leap should be allowed; as much care being taken in this respect as is taken by the owner of a thoroughbred horse or bull. Four or five ewes are as many as the ram should be allowed to serve in *one* day. Probably less would be better, although I have never detected any difference between one lambs in either case.

As soon as the ewe is served, let her be put out and kept out for at least *twenty-four* hours. Those who have their ewes numbered can register the time that each ewe is served, so that she can be cared for at the proper time of dropping her lamb—about five months after service.

The ram should be fed all the oats he will eat, twice a day, while he is being used, and should be kept in a yard or field by himself when not in use

This manner of using a ram may seem too particular to some who have never tried it, but if closely followed, the breeder can usually depend on having his lambs come strong and healthy.—*Cor. National Stock Journal.*

How to Raise the Young Horse.

To raise a young horse successfuly is to have him grow continuously, not crowding him either with an excess of fat or mettle. Oats fed largely will produce the latter, and will be too great a strain on the young system, which is tender and requires care in forming. Stimulating food should therefore be avoided. Corn disposes to fat, and the colt does not want to be unnecessarily burdened. He wants growth of limbs and frame generally, including muscle, bone, tendon, nerves, brain, &c., and this requires the nitrogenous and phosphoric elements rather than the carbonaceous. Indian corn disposes to fat rather than muscle; in barley, both winter and summer varieties, the disproportion is still greater; rye about the same as corn. These, therefore, should be very sparingly fed, and only when the hay or coarse fodder is of an inferior quality. Such hay, however, should not be fed to a young, growing horse, which requires all the more care so as to favor the advantage of growing, making all out of the animal that can be made.

A substitute for both hay and grain is good clover, or clover and timothy mixed. Clover hay contains a large proportion of muscle-making material, only, however, on the condition that it be cut and cured when in blossom. I know where colts in good condition, at the commencement of winter, have been fed on clover and timothy cured when green, and on that alone, during the entire winter and spring till put to grass, and they went to field in the finest possible condition, having grown uninterruptedly all the time. The reverse I have also known to be sadly the case—colts kept in a low condition, barely sustaining life, and in the spring they had to be lifted. This continued two winters in one case, with little grain during the summer; the animal, when grown, was a puny specimen of a horse. There was spirit enough, but the horse, not being permitted to grow when it should have grown, was small. You cannot make a horse grow longer than up to the sixth or seventh year. If you have kept him reduced you cannot make up after this time, which is the natural age for a horse to get his growth.

It will thus be seen that the treatment is to be a careful one and a discriminating one. Avoid the fat; avoid the stimulating food—that is, the grain—unless in small quantity, and then only when required from the poverty of the other feed. But this mishap and other mishaps should not be permitted. No one has a right to attempt to raise a horse unless he knows how, and has the disposition to do it, for only in this way are our best horses obtained. Out of a good colt you can make a comparatively poor horse. It is true blood will tell, but only in a degree, where it is accompanied with abuse or neglect. I am persuaded that a horse may be reduced from a quarter to nearly half his worth by bad usage in growth. Indeed, this may be set down as a fair average; the value can be brought down much lower, as I have seen in undoubted instances. You cannot get more out of a colt than he possesses, but you can greatly reduce by non-development.

To secure the best results, then, get first a good colt, by breeding from the proper stock, such as contains the qualities desired; nothing should be done at random. Second, see that all that the colt possesses gets a chance for development. You have matter just started from the germ. This you must make grow, and grow naturally and healthfully. You must not strain any of the tender parts, either mechanically or by feeding. They must not be kept down by suffering, such as exposure to the cold rains of the fall and spring, and the severity of the winter weather, or abuse by bad handling, or in any other way. This, and more that might be mentioned, all tells upon the growth of the young animal, retarding it and perverting it And, thirdly, there must not only be development fully carried out, but the proper training given. This, to be effective, must be begun, not when the colt is a year, or two, or three years old, then "broken," but at birth. You must develop your colt into what you want him. His ways, then, which you have directed, will be part of his nature as it were, and he will not know any other. It is your business that he know no other, that he will do what you want him to do. In order to accomplish this, you must never contradict yourself to your colt, which is sure to embarrass him, and may develop vicious propensities On the other hand, you must discourage all tendency to viciousness; discourage the bad, encourage the good, from birth up.

It is a delicate thing to undertake the making of a horse, especially a high-mettled one. You are to encourage and restrain, you must know beforehand what to encourage, what to restrain; you must undertake it with confidence and with a steady hand aided by a steady purpose. Good material can then be worked to a high attainment. And it pays to work with good material, and only with that. Remember the life of a horse is a long one—of use 25 to 30 years, if proper treatment be given—and there is large investment in a horse, compared with other stock, so that when a horse is undertaken it will pay to get a good one. Think of a horse being vicious or awkward, or otherwise unsatisfactory, during his whole lifetime, and you are to be pestered with him all this time, *every day.* And such cases are not unfrequent. Get then a good thing in your colt (you can afford considerable expense and trouble), and secure the proper training, whether by yourself or some one else, or purchase the horse already formed and trained Purchase him young, and you will have a long, agreeable career with him. He will be your reliable friend. Ah, the pleasure of reliability in a good horse!—*North British Agriculturist.*

Cure for Kidney-Worm and Mange.

A correspondent of the *American Farm Journal* thus gives his experience in treating kidney-worm, and mange, in hogs :—

I noticed that one of my hogs, a large Chester white sow, was a little weak in the back. On examining her, I found that it was with great difficulty she raised her fore feet in trying to walk. As I have had very little experience in raising hogs, I at once consulted a number of my neighbors. They all pronounced it kidney-worm, and, of course, each had a remedy. Some prescribed soapsuds, some, weak ye, copperas, blue vitriol, turpentine, etc. I gave each a fair trial, with no good result; and on the 20th of March she laid flat on her side, unable to turn over, and had not been on her feet for more than ten days, when a veterinary surgeon handed me a bottle of carbolic acid, and told me to use it as follows :—Ten drops, once a day, in drink; then put thirty drops in one gill of hot vinegar, and bathe the back over the kidneys once a day.

I gave her the first dose on Thursday, March 21st. On Sunday, the 24th, when I went out to feed her, she raised to her feet, and took two or three steps to meet me. By Saturday, the 30th, she was well and sound as ever.

The same remedy is equally good in treating mange. First, wash the hog well with soapsuds; then, to one pint of lard, while hot, add one ounce of carbolic acid, stirring it until it is cold. Rub the hog two or three times with this, and give yourself no uneasiness about the mange.

What is Thorough-bred?

What we call the thorough-bred horse was created in England by the importation of mares and stallions from Arabia and Barbary, and by the judicious commingling of the foreign with the native blood. Through contests on the turf, and the right kind of crossing, the horse was gradually improved, or elevated to a high standard of excellence, and these improved horses were then recognized as the progenitors of an aristocratic race. Equine heraldry has been made a science, and the birth and pedigree of each horse of high breeding has been preserved in the "Stud Book." Usage has decreed that an animal that can show an uncontaminated pedigree for five generations shall be classed as a thoroughbred; that is, no drop of cold or coarse blood must appear in the veins, the origin of which cannot be found behind five successive periods of re-production. Five removes from a common parentage refine the blood and make it aristocratic.—*Turf, Field and Farm.*

LARGE SHORT-HORN CALF.—A bull calf by Mayflower, out of 13th Duchess of Goodness, owned by Hon. H. Ludington, Milwaukee, weighed 232 pounds when six weeks old.

LARGE SHORT-HORN BULLS.—The *Michigan Farmer* says the Short-horn bull Ninth Duke of Hilldale weighed 1,888 pounds on the day he was two years old. Pickrell's bull Baron Lewis weighed 1,882 pounds the day after he was two years old.

Lord ——'s bailiff having been ordered by Lady ——to procure a sow of a breed and size she particularly described to him, came one day into the dining room, when full of great company, proclaiming, with a burst of joy he could not suppress, "I have been at Royston Fair, my lady, and got a sow exactly of your ladyship's breed and size."

SHORT-HORN OR DURHAM.—Occasionally we find persons in whose minds there is some confusion as to the proper use of the words Short-horn and Durham. For such we state that the two words are applied to the same breed of cattle, either of them being proper, but in this country Short-horn is almost exclusively used, and there is now no necessity for using the word Durham.

TO OPEN A COW'S TEAT.—At a recent meeting of the Stockton (Western New York) Farmers' Club, in response to a query as to the proper treatment of a cow with an injured teat, Mr. Pliny Smith would first put up a hen's quill into the teat, thus making an opening for the milk to flow out, but would not allow it to work out of reach; then irritate the unnatural orifice by cutting or otherwise, and bring it together by a bandage and wax until it has time to heal. O. J. Curtis keeps the quill from working out of reach by putting a small wire through it. Mr. Payne preferred to let the cow go until dry, and then he would operate as above, excepting that he would use a tube made of lead, which was better and more flexible than a quill, and less liable to injure the teat. He has used a leaden plug to open and close the orifice in the teat with success. Pliny Smith had also treated hard-milking cows in that way very successfully.

CONTRACTED FEET IN HORSES.—Wm. Horne, V.S, says in the *Western Farmer* that the following will cure contracted feet in an old horse:—Have the hoof pared close; open the cleft of the frog outwardly Pare until you can see the blood, then stop. This will, no doubt, make her more lame, but don't be afraid; don't let the blacksmith, or those same wiseacres scare you. I am giving you, not what I think or suppose, but what I know from experience, to be correct. When the hoofs are pared down, let her hobble around as best she can upon the snow, barefoot. Let her continue barefoot, and if you wish to use her by-and-by, when the roads permit, have a pair of toe-tips, made from a pair of her old shoes, tacked on to save the hoof from breaking. Make an ointment of mutton tallow one pound, gum turpentine one-fourth pound, spirits turpentine two fluid ounces. Mix over a slow fire and apply every day.

HORSE TAMING BY A MEXICAN.—A gentleman recently purchased a high-sprited horse that had never been shod. On the smith attempting to shoe him, he resisted all efforts, kicked aside everything, and nearly crippled himself against the anvil, when he was finally returned to his stable unshod. In despair his owner was about consigning him to the plough, when a gentleman, who had been a traveller and touched Mexican soil in his tour, took a cord, put it into the mouth of the horse like a bit, and tied it tightly on the animal's head, passing his left ear under the string, not painfully tight, but tight enough to keep the ear down and the cord in its place. This done, he patted the horse gently on the side of the head, and commanded him to follow, and instantly the horse obeyed, perfectly subdued and as gentle and obedient as a well trained dog; suffering his feet to be lifted with entire impunity, acting in all respects like an old stager. The gentleman states that this was a means restored to to in Mexico and South America for subduing wild horses. The plan is as ingenious as it is simple, and well worth the attention of those who have unmanageable horses.

JERSEY STOCK.—A very short time ago $300 was thought an extravagant price for a Jersey cow. Farmers were heard to say that no cow could be worth so much. But recently we heard the plain tale of a plain farmer whose extra butter, truly "gilt-edged," we were admiring at the tables appropriated to the dairy department at the New York State Fair, and which took the first premium. He is Mr. Wm. V. S. Beekman, of Saugerties, N. Y., the owner of a small dairy of six cows, who does all his work himself, farming, milking, and churning, and who reads and studies the *Agriculturist*. His butter sells for 65 cents a pound in the city of New York. His cows are pure Jerseys, and his pure pedigree Jersey bull was on exhibition at the same fair. Sixty-five cents is exactly double the price of extra Orange Co. pails in the market at that time. The difference goes to express the value of the Jersey over the native cow; and if some exterprising individual had not imported at some time the stock from which Mr. Beekman's cows are descended at possibly a cost of $1,000 or over per head, a great many such farmers as Mr. Beekman could never have possessed a Jersey cow.—*American Agriculturist.*

The Apiary.

Farmers Should be Bee-Keepers.

MR. EDITOR:—There are several reasons that present themselves to my mind, why the farmers should be the bee-keepers; and the profits from the flowers, produced upon their farms be theirs; as well as the profits of fields of grain and grass. The fields are theirs and they are entitled to the products. The product of honey may be secured with much less expense and trouble in proportion to its value, than the other products of their fields. From 50 to 200 lbs. of honey may be secured annually, upon each hundred acre farm, on an average; worth from $16 to $60—and require but an outlay of $10 for several years; (*i. e.*) the cost of one hive and swarm of bees.

I have a swarm placed in my hive in 1867, for which I paid $5, from which I have taken in three years 480 lbs. of white clover honey in boxes, and in the seven seasons including its first year has averaged more than 100 lbs. This, an ordinary season, I have taken from it 140 lbs., by August 2nd,—of course all white honey.

If we divide the cost of the hive and swarm ($10) into 1000 parts it will bring the actual cost of the honey at one cent per pound. But this is my best hive, the only one from which I have taken 200 lbs. of honey in one season, my next best gave me 174 lbs. But it can hardly be expected that farmers with only one or two hives of bees will seek to become expert in the management of bees and handle movable comb frames, raise queens, &c., &c.; nor is it necessary. The hive is constructed with either movable frames or bars. I have used both. The best hive of which I here speak is made with bars; and no trouble, but to put on the surplus boxes in their season and remove them when filled.

I have another hive from which I have this season taken 94 lbs. of surplus, all white clover honey; 234 lbs. from two colonies.

In many fields, I have no doubt, but they would have done better, and in some not as well. This is but an ordinary yield.

Any communication addressed to me upon the subject, at Albany, N.Y., will receive due attention.

JASPER HAZEN.

ALBANY, August 25th, 1873.

P. S. If we consider a few facts, the product of 200 lbs. surplus by a non-swarmer need not surprise us.

1. No surplus honey is stored by the swarmer, as a general rule, while the bees are making preparation for swarming. They cluster outside of the hive in idleness.'

2. If a second swarm issues eight or ten days more are lost.

3. Sometimes third and even fourth swarms issue.

4. All this time is improved by the whole working force of the whole colony in the non-swarmer. The old colony and all the new swarms are the product of the old queen, and all the brood in the first swarm. With such a force instead of working in three or more hives, all operating in one hive and its surplus boxes, with no loss of time in preparation for swarming, I think 200 lbs., and even more may be secured in surplus. J. H.

Agassiz on Honey Bees.

In a recent lecture, Professor Agassiz said in reference to honey bees, the bee hive consists, when in full activity, of one queen, several hundred drones, and many thousand working bees. These constitute a community by which a combined system of labor is carried on, transcending in many respects the most complicated actions of man himself. Their structure shows no organ similar to those by which the mental functions are manifested in the higher animals and in man. They have no brain proper, nor does their nervous system correspond in any way to that of the vertebrates. In all vertebrates the solid front mass of the nervous system, which we call the brain, is prolonged backward into a long cord, known as the spinal cord; in fact the whole central nervous system is enclosed in a cavity, the skull and canal, separate from those in which the organs of digestion, respiration, circulation and reproduction are contained—the chest and abdominal cavity. For the articulates, on the contrary, to which all insects, or crustacea and worms belong, the nervous system is scattered along the length of the body in a succession of swellings, connected together by threads. The first of these swellings, is situated in the head, above the alimentary canal, the rest are at regular distances along the lower side of the body. Thus it appears that the battery from which all volition starts, by which all the acts of life are performed or regulated, through which all external impressions are communicated and acted upon, are very different in these two types of the animal kingdom. It is, therefore, hardly probable that the like work done by these organs should be the same.

Instincts of Honey Bees.

Let us look at some of these acts by which the quality we call instinct is manifested in a community of bees. When such a community becomes too populous for a given hive, the bees "swarm," as it is called, that is, a part of the over-crowded population separates from the rest, and goes off to establish a new colony. In such a case the emigrants are chosen, or form their own bands, with direct reference, seemingly, to the future welfare of the new colony, preserving the numerical proportions characteristic of all prosperous hives. The swarm consists of one queen, and some thousands of working bees, or undeveloped females, some hundred of males or drones. This is the normal combination in the community, and hives so organized may survive and keep together for many years. There are reports of hives a century old. This is probably an exaggeration, for bee hives twenty years old are rare, and they do not often survive more than seven, eight, or perhaps ten years. When I speak of the life of a bee hive, I do not mean to say that the individuals composing it live together for that length of time; indeed, a queen rarely lives beyond three or four years, one of seven years is seldom seen, while the males never survive the summer in which they are born, and the working bees die gradually, and are replaced by new ones. But the hives as a community hold together for a long period, being constantly renewed by the process of reproduction, and come at last like a human settlement, to consist of a variety of individuals born at different times.

Queen Bees.

When a swarm breaks off from an old community to form a new colony, the division is generally due to the appearance of a new queen. The queen bee is usually quite contented with her lot, watching over her progeny, active and patient in the care of her eggs, and furious if a rival arises in the hive. She pounces upon her, and they sometimes fight to the death. So well is this understood in the hive that the workers take care to prevent such conflicts by holding back the new queen, just ready to be hatched from her royal cell, till the bees have swarmed. At such a time the workers will stand by the cell out of which a queen is to be born, ascertain how far her transformation is completed, and should there be a disposition of the young queen shortly to creep out they increase the deposit of wax upon the lid which shuts the cell, thus preventing the egress of the royal prisoner. If she tries to break through or attempts to gnaw her way out, the workers crowd around the opening, or accumulate such an amount of wax upon it as to frustrate all her efforts. When the old queen has peacefully departed, the new one is set free. What makes this fact more extraordinary is, that usually the workers have never seen the birth of a queen, or a perfect female before; their hive has known but one queen, and yet they anticipate and guard against all the dangers likely to arise from a second. Can it be that these creatures do the right thing at the right time, consciously by means of any faculty similar to our reason?

Bees and King-birds.

For the last ten years I have carefully noted the habits and movements of the king-birds, and have come to the following conclusion, viz.: that they do eat the honey-bee, and so does the purple martin; but instead of being destroyed for it, they should be protected, and allowed to build their nests near the farm-house, because they drive off the hawks, crows, and other plundering birds from the poultry-yard. Warm afternoons in July and August, when the drone bees are out, we have seen the martins come down within ten feet of the hive and snap up the drone bees, thus relieving the workers from the necessity of expelling them from the hive, and biting off their wings to prevent them from getting back to the hive. The king-bird, also, we find, selects the drone, and will come afternoons and take his position on a stake in front of the hive, and when a drone bee comes along will make a rush for him, come back to the stake, give him a pick or two, and swallow him. But says an objector, "What do they subsist on before the drone bees fly out?" This point I settled by shooting one in the month of May, and I found in his crop the wings and legs of May-bugs By watching their movements, I find the dragon-fly is also favorite food for them.—J. L. HERSEY, *American Bee Journal.*

Entomological Department.

Sembling.

On the 19th of June last a fine female *Cecropia* Emperor moth issued from its cocoon, which had been cut from an apple tree and kept in my study for some weeks. Being anxious to try the virtues of the process of "sembling," I fastened its wings by an ordinary spring clip and exposed it on my verandah for several nights without success; the evenings were fine and cool. On the 23th, the evening being warm and misty after a shower, the moth was exposed as usual on an empty flower-stand, just outside of an open window; inside the room on a table a lamp was kept burning. About 11 o'clock, p. m., I entered the room and observed nothing but a few ordinary *Noctuæ* flying about; on returning, however, an hour later, I was amazed to find four splendid specimens of the male Cecropia quietly at rest upon the table and lamp; a few moments after a fifth came in and flew wildly about the room, succeeded in a little while by a sixth! They were all in excellent order and evidently fresh from their cocoons. As I had kept the female so long in confinement, I determined not to continue the experiment any longer; I accordingly dispatched five of the males with chloroform, while the sixth was left with the object of his attraction. The result was a large batch of eggs and subsequent larvæ. As the female was entirely hidden from view underneath the window, and was not found by the males, who entered the room to the light instead, flying but a short distance over the fair one of whom they were in search, it is evident that they were guided to the spot by the sense of smell and not by sight. The light in the room could not have been the primary attraction, as it was so obscured by a trellis covered with creepers as to be hidden from view a few yards off.

Not long after I tried the same experiment with a female *Promethea*, but with no success whatever, though the evenings were often favorable. This failure I attributed to the scarcity of its food plants in the immediate neighborhood (its cocoon was brought from a considerable distance), and the consequent absence of males within reach of the female's attractive powers.—C. J. S. B. in *Canadian Entomologist.*

Tent Caterpillars—(*Clisiocampa*).

These pests were very numerous here this season, swarming on the trees of both orchard and forest. I observed one thorn tree on Montreal Mountain that had been completely stripped of its leaves by them, leaving nothing but a few old webs that one might fancy were banners left to mark the path of a victorious army. A little further on I found another horde encamped upon two thorn trees that were growing on each side of a large rock; not finding the leaves of the tree on which their parents had placed them to their tastes, they made a path across the rock to the tree at the other side, and upon which they climbed by two or three leaves that rested against the edge of the rock. Now, if it had not been for the leaves touching the rock, the caterpillars would have had to crawl down one tree and up the other whenever they needed food, and their instinct seemed to have taught them so, for, although the whole nestful of hungry caterpillars crossed the leaves every time they went to feed, not one of them attempted to eat their bridge, but passed further on before commencing their meal. In former seasons any of these caterpillars that I observed spinning up, chose the shelter of a fence, or crevices in bark, or some such place to make their cocoons in, but this season I found them rolling up leaves and making their cocoons inside them, and in some cases I found two cocoons in the same leaf. I found them spun up in almost every kind of leaf, Linden, Oak, Maple, Butternut, Thorn, Sweet Briar, Asclepias, Fern, &c. On Asclepias and Fern they only rolled one edge of the leaf, and sometimes spun up on the leaf exposed without any covering. I also saw several spun between stocks of grass; indeed they selected some most extraordinary places, for a friend of mine showed me one in a bird's nest. The nest was built in a fir tree, and contained four eggs, over which the cocoon was spun, and attached firmly to the sides of the nest; it would not have been so strange if the nest had been on any of its food plants, and built low down, but this was on a fir tree, and a good height from the ground. I suppose it may be set down as one of the freaks of nature. I selected cocoons from leaves of various trees and plants, and all of them proved to be *Clisiocampa sylvatica*, Harris.—F. B. Caulfield, in *Can. Entomologist.*

The Colorado Potato Beetle Varying its Food.

A generally received opinion in regard to the Colorado Potato Beetle—*Doryphora 10-lineata* (Say),—is that its food is confined to plants of the family *Solanaceæ*. I have found it this season (June 19, 1873) at Port Austin, Michigan, sparingly feeding on grass, on which it had also deposited its eggs. Later in the season (July 20), at Port Gratiot, Michigan, I encountered it in large numbers, in both the larva and perfect states, in the vicinity of potato fields (where it had committed terrible depredations) devouring the younger leaves and flower buds of the common thistle (*Cirsium lanceolatum* Scop.), which it was rapidly stripping, even to its thick stem, so that the entire top of the plant being closely shorn severed. In the same neighborhood I also saw it on pigweed (*Amarantus retroflexus* L.), hedge mustard (*Sisymbrium officinale* Scop.), the cultivated corn smart-weed (*Polygonum hydropiper* L.), and the red currant, and tomato of the gardens, as well as the common night-shade (*Solanum nigrum* L.), the last two its more legitimate food. But of the last-mentioned plants, with the exception of the night shade it ate only the young leaves, and of them very sparingly. The thistle it seemed particularly to relish. Could its attention be diverted from the potato to the Canada thistle, it would encounter a object worthy of its prowess; and the curses which have been heaped upon its striped back would be turned to blessings. But, I fear, little good can be hoped from the capacity, thus evinced, to diversify its food, and so accommodate itself to circumstances. This can only be regarded as another obstacle in the way of its extermination.

Since writing the above I have found the beetle feeding on the maple-leaved goose-foot (*Chenopodium hybridum* L.), lamb's quarters (*C. album* L.) and thoroughwort (*Eupatorium perfoliatum* L.), and August 8, 1872, I saw it in the larva and perfect states voraciously eating the black henbane (*Hyoscyamus niger* L.), on which was also to be seen an abundance of the eggs.—Henry Gillman, Detroit, Michigan, September, 1872, *in American Naturalist.*

Agricultural Ants.

Mr. Moggridge has observed at Menton, France, two species of ants (*Aphænogaster*) carrying into their nests, during the winter months, the seeds of certain late fruiting plants. He has traced their burrows to a spherical chamber filled with the seed of a grass which he had seen the ants in the act of transporting. "Outside the channels, there was generally a heap of the husks of the various seeds, and sometimes one of those heaps would fill a quart measure. These husks had had their farinaceous contents extracted through a hole in one side. He purposely strewed near the nests large quantities of millet and hemp seeds. After the lapse of a fortnight, many of these seeds, previously conveyed into nests, had been brought out again, they having evidently commenced to germinate, and he then found that the radicle was gnawed off from each seed, so as to prevent further growth and, this being effected, the seeds were carried back again. The Cotyledons of germinated seeds were removed from the nest."—*Trans. Entomological Society, of London.*

Walking Stick or Spectre.—This insect belongs to the *Phasmidæ*, commonly called spectres or walking sticks and are found in tropical countries which they bear a strong resemblance, as their bodies are very long and slender, and as they usually lack wings. Some of the species (though they are not native to this country) imitate leaves so closely by the shape and venation of the wings, that the resemblance is striking. The wings are large and broad and the legs also have leaf like expansions.

A dragon fly balanced on its wings at the side of a car speeding its way over the rails at the rate of forty miles an hour, appears to be almost motionless. But to keep up with the car, its wings must vibrate many thousand times a second. The eye cannot detect their up and down action, so exceedingly rapid are the contractions and relaxations of the muscles acting upon them. All at once they dart off at a right angle so quickly that the retina cannot have an impression remaining long enough to trace their course. Therefore, those same muscles, too small to be seen but by powerful microscopic assistance, must be urged to still more rapid action. Such muscular activity far exceeds the vibration of musical chords, and, therefore, exceedingly perplexes entomologists, because the nervous system of insects is so extremely minute. The question is: How much power is generated for keeping a dragon-fly's wings in uninterrupted motion for many hours in succession without apparent fatigue?—*Scientific American.*

Miscellaneous.

Peruvian Guano Deposits.

The following, from the Peruvian Minister, relates to the important question of the existing guano deposits in that Republic:—

"Peruvian Legation, London, Oct. 25, 1873.

"Sir,—By the last mail from Peru, this Legation has received the following official list of the guano deposits of that Republic. Up to the present date the only deposits which have been measured are those on the 'Islas de Lobos' and immediately surrounding islands, the Macabi and Guanape Islands, and those of the 'Bahia del Ferrol,' surveyed by Mr. Davis in 1862. The remainder are now being measured.

"It should be borne in mind that, as in the case of the Chincha Islands, which were estimated by Mr. Elias in 1853 to contain eight years' consumption, whereas in reality they have lasted 19 years, so the Macabi and Guanape Islands, which Mr. Davis calculated to contain 2,248,000 tons, will undoubtedly produce very much more, because since 1870, according to official accounts, the exportation from these deposits has been about 1,443,214 tons—that is, more than half the amount of Mr. Davis's estimate—and no one will venture to assert that these deposits have been reduced by anything like one half. On the contrary, there is every prospect of their producing double the number of tons they were supposed to contain. This is easily explained by the difficulty of making anything approaching to an exact measurement or calculation of the deposits of guano, which are on uneven surfaces, and differ materially in their solidity in various localities.

"Few persons are aware of these circumstances, and many ignore the existence of numerous other deposits which have not as yet been measured, but all of which are of more or less importance, and, consequently, I trust you will kindly insert these few remarks for their information.—I am, Sir, your obedient servant.

"P. Galvez, Minister for Peru."

List of the Guano Deposits of Peru.

Quebrada del Loa.—Coatings of guano exist on a dark hill.

Bahia de Chipana.—Rounding the point of Chipana, there exists a fair deposit of guano.

Punta de Huanillo.—About six miles and a half to the north there is an abundant deposit of guano.

Punta y Bahia Chomache.—Some patches of guano are found here. It is an inhabited place.

Islotes de los Pajeros.—Coatings of white guano. These islands are much resorted to by birds and seals.

Punta d'o Lobos ò Blanca.—A great quantity of guano exists here, and its quality is very similar to the Chincha guano.

Cuebrada de Pica.—Coatings of guano in various places.

Pabellon de Pica.—Great quantities of guano, notwithstanding all that has been taken for the agriculture of the country.

Caleta de Pabellon.—A place well situated for extracting guano.

Punta de Patachi.—Great patches of guano in various places.

Islotes y Caletas de Patillos.—A thin coating of guano.

Ensenada Iquiquinaba.—Throughout the whole of this place there exists guano deposits just like those of the "Punta de Lobos," covered with a sort of chalky sand.

Islotes Cololue.—Thin coatings of guano.

Caleta de Mejillones.—On the hill as well as on the islands thin coatings of guano are found.

Cabo de Lobos.—Thin coatings of guano.

La Capilla.—Whitish patches and coatings which manifest the existence of guano.

Morro de Arica.—Thin coatings of white guano.

Islote de Jesus.—Thin coatings of white guano.

Punta de Pescadores.—On the surface there are some patches of guano.

Punta de Atico.—Patches of guano on the surface.

Punta de Lobos.—Slight patches of guano.

Punta de San Nicolas.—Thin coatings of guano.

Punta de Dona Maria.—Thin coats of guano.

Isla de las Viejas.—A great quantity of guano.

Islote Zarate.—Coatings of guano in some places.

Isla de San Gallan.—Patches of guano in different places.

Bahia de la Independencia.—One of the largest guano deposits. Up to this date it has not been touched, but is calculated to contain a great many tons.

Isla ó Isloto de Ballesta.—Its surface is covered with a coating of guano.

Isla Blaca.—Summit covered with a coating of guano.

Islas de Chincha.—Very little guano.

Isla de Asia.—Covered with thin coatings of guano.

Punta de Chocalla.—White Patches of guano.

Isla Pachacamac.—Covered with thin coatings of guano.

Punta Solar.—Covered with a thin coating of guano.

Hormigis de Afuera.—One of these islands contains a little guano.

Punto de Pancha.—Thin coatings of guano.

Islotes de Pescadores.—Thin coatings of guano.

Islotes Chiguitina.—Covered with a thin coating of guano.

Isloto Bravoy Quitacalsones.—Covered by a thin coating of white guano.

Isla Mashorca.—Contains a fair quantity of guano.

Isloto de Carguin.—A thin coating of very white guano.

Isla Blanca.—Thin coatings of light colored guano.

Isla de Chao.—Slight coating of white guanos.

Islas de Guanape.—Considerable deposits of guano.

Islas de Macabi.—The southern island is entirely covered with guano; the northern island contains less.

Bahia del Ferrol.

Islas de Lobos de Afuera.—These are entirely covered with guano in great quantities.

Islas de Lobos de Tiera. These contain a great quality of guano.

Superstition Among Farmers.

It would seem, says a writer, that if any man should have a correct understanding of the workings of nature and be able to read all her varied handwritings, that man should be the farmer, whose occupation leads to constant intercourse and communion with her at all seasons of the year And this is true when he goes out free from prejudice and with an intelligent purpose to read and understand her teachings. But, unfortunately, such cases are comparatively so rare as to give countenance to the charge that farmers, as a class, are an ignorant and superstitious set of people. A large proportion of farmers believe that the moon rules and controls this lower world. They worship it as a kind of deity that prevails over the vegetable world. They labor under the impression that the moon is constantly "changing" and producing corresponding changes in the vegetable and animal kingdom. They not only hold these notions theoretically but they are influenced by them in the practical operations of their business. One man will plant potatoes, beets, carrots and other root-producing plants only when the moon is waning or "going down," that the vigor of the plant may go down to form roots, corn, cabbage and other top-growing crops must be planted when the moon is increasing, so the growth may be upward; the fence must be built when the moon is increasing so it will not settle into the ground; the house must not be shingled in the dark of the moon, so the shingles will not curl up; hogs must be butchered in the increase of the moon, so the meat may increase in the process of cooking; and in a hundred other equally absurd forms does this superstition manifest itself. As above stated such persons believe the moon really undergoes frequent changes. But this is not the case; the moon does not change at all. Its apparent changes are produced by a change in the relative position of ourselves to it and the sun, which change is produced by the diurnal revolution of the earth and the fact that the revolution of the moon around the earth does not exactly coincide with the daily revolution of the earth itself. All the change there is about it consists in the fact that this week we stand where we see the side that is turned toward the sun; next week we have moved over so we see part of the light side, and part of the dark side, the next week the whole of the dark side is turned toward us. How absurd to suppose that the mere change of relation between us and the moon should produce such changes in the material world as are mentioned above! Observation, as well as reason, teaches that no such influence is exerted by the moon. Out of more than one thousand recorded observations of the moon's change, considerably less than one-half were followed immediately by any change in the weather. In a careful observation of twenty years, I have found all the moon signs governing the weather have failed oftener than they have been fulfilled. What reliance can be placed in a sign that fails twice out of every three times that it occurs? Does it not fail to be a sign at all, except to the superstitious? Many people, otherwise sufficiently devout, and having strong faith in an overruling Providence, become practical atheists on Friday. They seem to think on that day of the week the Great Ruler lets go the reins of the universe, and permits the forces of nature to run riot, without any control or hindrance. Hence they fear to enter upon any new enterprise, or begin any new job of work on Friday, lest they have bad luck. Perhaps a majority of the farmers of the country believe that wheat will turn to "cheat" (chess). While such absurd and nonsensical notions exist, and prevail among farmers, it is not strange that we are, as a class, branded with ignorance and superstition. It is the work of the agricultural press to dispel this darkness, and shed forth the light of true science

A Convenient Way to Measure Land.

It is frequently desirable to measure a given plot of ground, or a portion of a field, and a simple method, such as the following, for which we are indebted to an exchange, will be of use to many of our readers. Surveyors are not always at a convenient distance to attend to such little jobs; and even when they do reside in the immediate vicinity, one does not always care to incur the expense incident to such a small job. If the lines are already established, the plot can be measured with sufficient accuracy for all practical purposes by means of a neat rod-pole, made as follows:—Procure a stick of pine, white-wood, basswood, or almost any other timber, one and a half inches square, and sixteen and a half feet long. Dress each end tapering from the middle, so that the pole will be one and a half inches square at the middle, and about half an inch square at each end. Such a pole will be light, and quite stiff. Now, graduate one side with the marks representing feet and inches, and graduate another side to indicate a surveyor's links. A pole one rod in length must be equal to twenty-five links. To divide one side correctly, let a mechanic's compass be adjusted, so that the points will divide the distance into twenty-five equal spaces or links. A line can be measured with such a pole nearly as accurately as with a surveyor's chain.

Now, then, if a person does not understand how to multiply chains and links, let him compute the measurement by square feet. In one acre there are 43,500 square feet. Any intelligent school boy can measure the length and the breadth of a square plot, multiply one by the other, and divide the product by 43,500, which will give the number of acres, and the number of square rods representing the fraction of an acre. If it is desirable to measure a triangular plot, two sides of which lie at right angles, measure these two sides, multiply the distance in feet one by the other, and divide that product by two, which will indicate the number of square feet, by 43,500, and the quotient will represent the number of acres.

How Raisins are Manufactured.

Charles Nordhoff, writing from California to the New York *Tribune*, speaks of the manufacture o raisins as follows:—"For making raisins, they wait until the grape is fully ripe, and then carefully cut off the bunches and lay them either on a hard clay floor, formed in the open air, or on brown paper laid between the vine-rows. They do not trim out poor grapes from the bunches, because, as they assert, there are none; but I suspect this will have to be done for the very finest raisins, such as would tempt a reluctant buyer. The bunches require from eighteen to twenty-four days' exposure in the sun to be cured. During that time they are gently turned from time to time, and such as are earliest cured are removed to a raisin-house. This is fitted with shelves, on which the raisins are laid about a foot thick, and here they are allowed to sweat a little. If they sweat too much the sugar candies on the outside, and this deteriorates the quality of the raisin. It is an object to keep the bloom on the berries. They are kept in the raisin-house, I believe, two or six weeks, when they are dry enough to box. It is as yet customary to put them in twenty-five pound boxes, but no doubt, as more experience is gained, farmers will contrive other parcels.

Cure for Corns.—Dr. Barbier, says the *Lyons Medical Journal*, reports the cure of the most refractory corns by the morning and evening application, with a brush, of a drop of a solution of the per chloride of iron. After a fortnight's continued application, without pain, a patient who had suffered martydom for nearly forty years from a most painful corn on the inner side of each little toe, was entirely relieved. Pressure was no longer painful, and Dr. B. believed the cure radical.

Dangers of Well-Water.

The dangers of bad milk are engrossing so much attention just now, that there is reason to fear lest the far greater dangers of bad water should for the time be overlooked. We trust this serious error will not be committed. For one sample of dangerous milk a thousand of dangerous water could be obtained in almost any part of the country. Let it never be forgotten that very few rivers or wells are safe sources of water supply, and that many are as unsafe as loaded fire-arms. The shallow wells of villages are among the pests of the country, and it is high time that a zealous and well organized crusade should be brought to bear upon them. It is sickening in most country places to observe the uniformity with which the cesspool and well are made to stand side by side, as though each was necessary for the other; and to think of the twenty feet or so of foul, sewerage-reeking soil through which the water percolates to its fetid bed! The question should engage the earnest attention of every health officer, and will, in too many cases, tax his energies severely, for it is one of the hardest sanitary problems. It is always possible to provide a city or town with good water, but in a village, where houses are few, money scarce, and intelligence scarcer, it is a matter of exceeding difficulty.—*London Lancet.*

The Lumber Trade.

We clip the following item on the above subject from one of our American exchanges:—

"Owing to the recent panic, productions in excess of demand, and other causes, it is estimated that transactions in the Albany lumber trade this season will be 25 per cent. less than in 1872. Probably 100,000,000 feet of stock will remain at the close of navigation, although the receipts this year will be 60,000,000 feet less than in 1872. Prices are very low; common grades are offered at cost, dealers refusing to sell lower. About 3,000 men and 200 carts are generally required to land, pile and ship the lumber.

Mr. John Stewart Mill, we learn from *Nature*, has left his herbarium of European plants to the Royal Gardens, Kew.

According to an Alabama newspaper, the shooting of insectivorous birds has cost that state £2,000,000 this year alone, in the ravages made by the "cotton caterpillar."

Over the shop door of a pork butcher in a village in the Eastern counties may be seen a signboard representing a man in a black coat, brandishing a hatchet, with the inscription,—"John Smith kills pigs like his father."

"Mary where's the frying-pan?" asked a worthy old woman in the far west. "Jemmy's got it, carting mud and clam shells up the alley, with the cat for the horse." "The dear little fellow! what a genius he will make! but go and get it, we're going to have company, and must fry some fish for dinner."

A remarkable illustration of the power of a growing mushroom can be seen at Keene, N. H., where a toadstool has grown up under the concrete walk, breaking and pushing it until it has made room for itself. The concrete in that place is nearly an inch thick, and would hold up a heavily loaded team.

How to Catch Owls.—A Jersey paper says:—"When you discover one on a tree, and find that it is looking at you, all that you have to do is to turn round the tree several time, when the owl's attention will be so firmly fixed that, forgetting the necessity of turning its body with its head, it will follow your motions until it wrings its own head off."

For refinement of horse thief strategy go to Texas. Down there these gentlemen go in gangs, headed by a pretended clergyman, who gets up protracted and zealous meetings, and while he is taking the congregation upwards on the wings of his eloquence the rank and file make a descent, steal all the horses, and are off before their presence is known.

"James Jenkins," said a schoolmaster to his pupil, "what is an average?" "A thing, sir," answered the scholar, promptly, "that hens lay eggs on." "Why do you say that, you silly boy?" inquired the pedagogue. "Because sir," said the youth, "I heard a gentleman say the other day as a hen would lay on an average 120 eggs a year."

To Clean Coat-Collars.—Take a piece of ammonia-stone (carbonate of ammonia) the size of a walnut and put it in a cup of warm water. When dissolved, take a piece of clean flannel and dip it in the solution and rub the collar two or three times with it. It will also remove the glossy appearance along the seams and upon the elbows.

To Poison Foxes.—For the benefit of poultry raisers, I will give the following:—"Procure a young chick, about the size of a robin. Make a small incision under the wing, just through the skin, and insert a dose of strychnin; tie the chick to a stake with a thread outside of the coop where the fox has been in the habit of visiting, and his next visit will be his last. The reason for using live bait is this: the fox prefers to kill his own game—to be sure that he is always getting it fresh. If the bait should not be called for, care should be taken to dispose of it, as it would prove sure death to the animal eating it.' —*Farmer's Union.*

During last month, the officers of the Fishmongers' Company seized at Billingsgate, and destroyed no fewer than 63 tons 12 cwt. of fish, as unfit for human food. All of it had been brought there by rail. Of this quantity, there were 116,759 plaice, 10,090 haddocks, 8,100 smelts, 8,200 whiting, 37 brill, 1 catfish, 3 coalfish, 441 cod, 360 crabs, 4,000 dabs, 122 hake, 1,800 herrings, 2 ling, 108 lobsters, 263 mackerel, 1,200 "pollocks," 1339 soles, 620 thornbacks, and 146 turbot, making 153,561 fish in all; and, in addition, 2 bushels of cockles, 2 of mussels, 5 of periwinkles, and 2 of whelks, 762 gallons of shrimps, and 400 lbs. of eels.

Some of the California exchanges want to call their farms "Farms," and not "Ranches;" the latter name being too suggestive of greasers, long-horned Spanish cattle, a tumble-down shanty, a corral, with the fence covered with rawhides, and a middle-aged "tar-face" jerking beef! The word does not at all describe the well-cared for farm, all fenced in, and stocked with blooded horses, cattle or sheep. "The Farm" sounds so much better.

—I want to be a Granger,
And with the Grangers stand—
A horny-fisted farmer,
With a hay-stack in my hand.

Beneath the tall tomato tree,
I'll swing the glittering hoe,
And smite the wild potato bug,
As he skips o'er the snow.

I've bought myself a Durham ram,
And a gray alpaca cow,
A lock-stitch osage orange hedge,
And a patent leather plough.

Trades of Animals.—It has been well remarked by a clever author that bees are geometricians. The cells are so constructed as, with the least quantity of material, to have the largest sized spaces and the least possible interstices. The mule is a meteorologist. The topedo, the ray and the electric eel are electricians. Whole tribes of birds are musicians. The beaver is an architect, builder and wood-cutter; he cuts down trees, and erects houses and dams. The marmot is a civil engineer, he not only builds houses, but constructs aqueducts and drains to keep them dry. The ant is a soldier, and maintains a regular standing army. Wasps are paper manufacturers. Caterpillars are silk-spinners. The squirrel is a ferryman; with a chip or a piece of bark for a boat, and his tail for a sail, he crosses a stream. Dogs, wolves, jackals, and many others are hunters. Black bears and herons are fishermen. Ants are day-laborers. Monkeys are rope-dancers.

Building Stone and Fire.—In a recent article treating of the resistance to fire offered by the various kind of stone used in building, Dr. Adolf Ott asserts that the presence of magnesia in limestone (magnesian limestone, dolomite) hastens the decomposition of the mass under the action of heat, the magnesia parting with its carbonic acid at the comparatively low temperature of 600° Fahrenheit. Common limestone will stand a higher temperature without decomposition. It appears that in Chicago, and probably also in Boston, the sandstones made the most obstinate resistance to the heat. This is explained by the fact that the chief ingredient in stones of that class is quartz, a substance remarkable for its infusibility. As for granite, gneiss, mica slate, and other rocks of the primary formation, which are commonly esteemed indestructible, Dr. Ott shows that they can make but feeble resistance to heat. The water enclosed in such rocks accounts for their bursting and exploding when heated. Portland cement stone is said to show extraordinary resistant power, almost equalling sandstone in this respect. Of brick walls the author is disposed to think well, provided they be honestly built of hard material throughout, and of the requisite degree of thickness.

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