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The Field.

Lowland Farming.

Col. Waring, who contributes to the columns of the *American Agriculturist* a series of articles entitled "Ogden Farm Papers," has been touring in Europe, and in the November number of the journal for which he writes, gives a very interesting account of the methods pursued in Holland, by which vast areas of low, wet, and at one time, submerged lands, have been transformed into smiling and productive fields. By these methods, the former abodes of fishes have become the seats of the most prosperous agriculture in Europe, and there can be no doubt they might be imitated to advantage in many parts of the western world. It would not require more energy than has already availed to turn vast spaces of dense forest into cleared and fruitful fields, to transform wide stretches of marsh and swamp into low districts of great value and utility.

The system adopted has been first to enclose low-lying and wet lands with dykes or earth walls, and then pump out the water by means of wind-mills, or steam-pumps. In some cases, after the water has been removed, only beds of barren peat, several feet or yards deep have been found. But such has been the perseverance of that hardy and industrious people, that by slow degrees the peat has been cut up, dried and made into fuel, shipped away in vessels, and return cargoes of soil and city refuse deposited in its place. Embanked canals, high above the level of the fields, furnish ready means of transportation for produce during the navigable season, and in winter, even the Dutch girls go to market on skates, carrying baskets full of eggs upon their heads, and balancing them with wonderful dexterity, as they perform the fancy movement so well known to fancy skaters as the "Dutch roll." To show on what a large scale these improvements have been, and are being effected Col. Waring says:—

"Arrangements are already being made for the drainage of the Zuyder Zee, a work which will cost over \$50,000,000, and which will take twelve years for its preparation alone. When the enormous dyke shall have been built, and new channels shall have been made for the rivers which flow into it, it will take the sixty-three enormous steam-engines several years (working night and day) to pump out its water, which has an area of about 500,000 acres, and an average depth of about ten feet. A survey has been made of the whole bottom, and the plan of improvement includes the division of the land, and the construction of the canals (for drainage and for communication) which are to serve the future generations which are to inhabit it. This scheme would seem wild and impossible were it not for the experience of Haarlem Lake, which lies within a few miles of it. This magnificent farming district was only twenty-five years ago a navigable sea, about sixteen miles long, and seven miles wide. It lay between the cities of Amsterdam and Haarlem, its surface nearly level with their streets, and threatening them both with

destruction during heavy storms. As a measure of safety it was determined to annihilate it. It was surrounded by two immense dykes over thirty miles long, inclosing a canal, and three engines with a combined force of 1,200 horse-power were set at work to pump out its waters. At the end of 3½ years of incessant activity, its bottom was laid dry, and now its 45,000 acres, lying about fourteen feet below the level of the sea, are busy with the production of food for the cities which the lake so lately menaced."

To illustrate the style of farming which is pursued, some account is given of a visit paid to the farm of a Mr. Wouter Sluis, which is situated near a neat old Dutch village, in the very centre of what was once the "Beenster Lake," drained 250 years ago, and furnishing about 17,000 acres of what is now among the richest dairy farming lands in Holland. This district lies about twelve feet below the level of the sea, and is surrounded by a canal, into which its drainage is pumped by fifty-four enormous wind-mills, which work only in winter, and after heavy rains. The farm visited consists of 123 acres, and is valued at \$500 per acre. Only twelve acres are ploughed each year, the remainder being kept in clover and grass. The fields are divided by ditches, which answer the twofold purpose of drains and manure canals, in which hay and manure are conveyed by means of boats. The stock consists of 45 cows, 24 head of young horned stock, 5 horses, 160 sheep, and about 19 swine. The cows are of the Dutch breed, bred and selected for dairy qualities, and judged when young, mainly according to the "escutcheon," or "milk-mirror" standard of Guenon, which is considered in Holland an unfailing index to the milk promise of a heifer calf. Such as, according to his rule, are thought inferior, are sent to the butcher. The sheep are of high excellence, being crossed with prize animals from English exhibitions.

The chief industry of this and the adjacent farms, is the production of the well known Dutch cheeses of commerce, weighing about four pounds each, and looking very much like cannon balls. We omit the Colonel's account of their manufacture, lest this article should grow tedious.

Mr. Sluis's farmstead is so unique, and so completely illustrative of what is common in Holland, that we cannot resist the temptation of quoting the description of it in full. It has one feature about it which was embodied in an engraving of a model Canadian farmstead, which appeared in this journal a short time since. We refer to the arrangement by which the dwelling and other farm buildings are connected, so that access can be had to all of them without going out-of-doors. We believe that for a climate such as ours, this is a very desirable arrangement, and far preferable to the common plan of having long distances between the house and barn, rendering the passage between them at inclement, stormy, and snow-drifting times, a most formidable undertaking. We do not advocate the Dutch plan precisely, of having all under one roof, but we are strongly in favor of connecting the buildings by sheds and covered passages, and having an enclosed area in the centre. Here is the description of Mr. Sluis's homestead:—

"One thing about this farm (and the same is true of nearly all farms in Holland) strikes the American

very oddly. There was but one building of any consequence on the whole farm—an enormous, broad building, with a "hooded" gable at the front and all covered with red tiles. The front part of the house—spacious and comfortable, and with a few bits of old furniture, and Japanese pottery, and some fine books, which gave it an air of decided respect. Back of this (and opening into it), occupying the whole width of the building, was the cow-stable, with two rows of mangers, and water-troughs and a central alley, which is floored with bricks. The troughs are simply depressions or gutters at the ends of this alley, and are also of brick. They are filled from a pump at one end, and the water is let off (as a pressure) at the other. The cows stand on a raised earthen floor, which has a brick wall to support its rear part. Behind them is a deep manure trough, which retains the solid droppings, and allows the urine to flow to a liquid-manure cistern, which accumulates all the liquid refuse of the establishment, and which has a pump for filling the tank-cart for sprinkling the meadows. During summer, when the cattle are constantly in the field, the earthen floor is covered with handsome Dutch tiles. At the time of our visit, this stable was so scrupulously clean and bright that we mistook it for a huge milk room. Back of the stable (in the loft over which the cheeses are seasoned) are the hay-loft, the cheese factory, horse stables, wagon house, tool sheds, etc. To our American ideas, this close contiguity of stable and dwelling seemed at least odd, but it is the universal custom in this almost absurdly clean and well-washed land, even among the wealthiest farmers, and there are many who count their riches by hundreds of thousands."

The implements, vehicles, and agricultural processes in vogue among the farmers of Holland, would seem to be rather primitive and rude, but the industry of the people makes up for all disadvantages, and while Canadian and American farmers complain that their's is an unprofitable business, with all the facilities nature has given them, these plodding Dutchmen manage to make their business pay, and many of them not only get a comfortable living, but actually grow rich. Col. Waring well remarks in concluding his instructive paper:—

"As farmers and as people we can learn from them one lesson of the utmost value—that is in the matter of making the waste wet places of the earth to blossom like the rose. The hundreds of thousands of acres of marsh lands along our sea-boards and our river-bottoms need far less outlay than the Dutch morasses to rival the wonderful fertility to which they have attained; and we can learn from them the best manner of making the reclamations."

ARE ALL POTATOES ALIKE LIABLE TO ATTACK.—During the course of our inspection, we frequently met with gardens and fields containing two or more kinds of potatoes, and observed in many instances one sort was very much more affected by the insect than the others. The *Meshannock* is particularly liable to attack, while the *Early Rose* and *Peach Blow* are less so; but where the latter are the only varieties planted, these insects do not hesitate to devour them. The only practical suggestion we can make in reference to this point is, that it might be well to plant a few of such sorts as are most liable to be injured, so as to attract the larger proportion of the insects to one spot, and thus enable the cultivator to destroy them with less labor and expense.—*Colonial Farmer.*

New Potatoes.

Sir Joseph Banks states that the potato was probably introduced into England by the colonists sent out by Sir Walter Raleigh to Virginia, in the year 1586. Be this as it may, ever since the potato famine in Ireland, many years ago, this excellent has had a tendency to rot wherever it has been grown all over the world. And it has been so ever since the varieties, after a few years' success, have, for some cause, but principally from the rot which appeared, and have become altogether lost. This will be evident to any one who will call to remembrance those kinds which were common in this country fifteen or twenty years ago, such as the "Copper Coat," "Pink Eye," "Cups," "Bluenose," &c. These have all had their day, and have been superseded by the "Tomsonian Ohio," &c, now becoming extinct from the same cause, and the gap is again being filled by the more recent "Carnet Chili," and its seedling, the "Early Rose." In the old country, the most successful originator of new kinds of this vegetable, was Mr. William Paterson, of Dundee, Scotland, and his marvellous success has made his name celebrated. Amongst the prizes carried off by this gentleman we may mention the diploma of honor and prize medal at the Erfurt (Hanover) Universal Exhibition; the Society's prize medal of the Liverpool and Manchester Agricultural Exhibition, at Oldham and Wigan (England); the chief prize at the Dublin International Exhibition; and in 1869, the Highland and Agricultural Society awarded Mr. Paterson their Gold Medal for his "Report on Experiments in Propagating New and Superior Varieties of the Potato Plant."

Since his death which took place in 1870, Mrs. Paterson has been carrying on his work, and has received the prize medal for samples of Paterson's "Bovina," at the Show of the Manchester and Birmingham Agricultural Society, held at Wigan, in Sept., 1870; and the first cup ever given for potatoes was presented by Sutton & Sons, for seventeen varieties of Paterson's seedling potatoes, exhibited at the Royal Berkshire Show, Nov., 1870, also twenty-six varieties of the same at the Manchester and Birmingham Show, held at Liverpool, Nov. 17, 1870. One of these was the "Bovina," a kind most valuable for feeding to cattle, being the largest sized and heaviest cropper in the known world. Twenty of these potatoes have been known to weigh eighty pounds, and as many as sixteen hundred bushels have been grown on a single acre of extra good soil, with special cultivation and manures, in Scotland. It is to be regretted that though the "Bovina" has been tried by Bruce, of Hamilton, Mather and others, at Ottawa, and by some gentlemen in the eastern townships below Montreal, it has not been found to succeed in this country, the season apparently not being of sufficient duration for its growth. Two highly enterprising gentlemen of Ottawa, however, at great expense, imported several others of Paterson's potatoes in 1871, and they have proved themselves very much superior, both as croppers and otherwise, to either the Garnet Chili, the Early Rose, or the Tomsonian. They are floury from the peel to the heart, and have, to a high degree, that nut-like potato flavor so much prized by epicures. The writer of this notice has no interest whatever of a pecuniary sort in the dissemination of these potatoes, but would like to see them generally cultivated as a very superior species for the reasons stated. The three varieties imported are the New White Kidney, the Victoria (white), and Prince Albert, (dark purple skin, white fleshed). These are all, so far, perfectly disease-proof, never having been known to rot in the slightest degree. The growing of them has never been forced beyond good cultivation, and they have at all times been propagated from whole potatoes. Cutting into sets was supposed by Paterson to be one of the causes of so much dis-

ease. It is known by potato growers that the Garnet Chili yields from three to five large tubers to a root, the Early Rose somewhat more, but the Prince Albert has frequently yielded forty-six eatable potatoes of fair average size, and a medium root will turn out thirty-six, and will exceed in weight, one with another, the Tomsonian.

We look with interest upon every endeavor to renew the potato stock of the world. The more really good varieties we can have the better. Our farmers generally are now supplied with the Early Gooderich, Early Rose, and other American varieties recently introduced; and we hope the same enterprising spirit will secure the diffusion of such English kinds as those referred to above. A little extra outlay thus invested, will bring a remunerative return, and be of public as well as individual benefit.

Crossing Wheat.

Amel B. Jones, Minnesota, writes to the *Farmer's Union*.—"The reason wheat does not mix when several kinds are sown together, is because the pollen discharges in the chaff and cannot get out until it is dead, and can act only on its own pistils, which die soon after being fertilized."

The above shows that wheat is subject to in-and-in breeding, which no doubt causes wheat to run out or degenerate. In-breeding, in wheat, the same as in animals, decreases its good qualities—slowly at first, while health and vigor last; when diseases commences, then it degenerates fast. Then the straw becomes each year more brittle, and is more liable to straw fall. There will be less pollen in the blow, and less vitality in it, which causes a great many of the small blows to fail to fill their chaff with grain. If a variety of wheat is run out, there is no use to try to improve it by change of climate, soil, or any other means. You might just as well try to make an old horse young by extra care and feed.

The longer we continue to sow Scotch Fife, the more care and better farming will be needed to get an average crop.

Wheat's not crossing also prevents its not acclimatizing. A few may differ and want proof. And they can easily see if they will take the best ear of corn they can get from any large field and plant each grain separate with equal chance, and they may not get two grains that will grow and raise corn exactly alike.

If you take a head of wheat and plant each grain separate, they will produce heads that are alike, and no choice head will do any better, but you can select from the ear of corn, early and late kinds, and by choosing the qualities wanted, can be made to adapt itself to climate or soil, and will never degenerate, because it is continually producing new varieties by crossing while blooming. I don't believe wholesale crossing is any advantage, because if done artificially, a higher state of improvement can be obtained, because the best variety can be kept pure.

All will admit that it would be a great advantage if the best horse in the world could be made to get his equal every time but that cannot be, because the horse and the mare are not exactly alike, and therefore no offspring from them are exactly like each other or either parent.

The same laws hold good in the vegetable kingdom, and as wheat is a self-impregnating hermaphrodite and both parents are one and must be alike, therefore they must produce alike, which makes it capable of the highest state of improvement by hybridizing.

If any one doubts it, one look at my new hybrids will convince him.

I have a new hybrid that will head sooner than spring barley, if sown same time as barley. I believe my new hybrids are far ahead of any spring wheat in the world, and will give the Western wheat growers advantages they never expected.

Stay on the Farm.

Look at an American home, and see what can be done by cultivation. When I look at one of our village homes, extending over a half acre, with house in the middle, fruit trees back, shade trees in front and flowers scattered everywhere, I feel like wishing that all of God's broad acres were made to blossom as the rose. Look at a flower bed and consider how much beauty we manage to sprinkle into a square rod of ground when we choose.

Let no tiller of the ground be ashamed of his brawny arm, sunburnt face, and hard, cracked hands. They are marks of noble industry, elevating and

refining labor. If it is elevating and refining to paint God's fields on canvas, or praise them in song, why not elevating and refining to tend them, make their fragrance, and draw inspiration from their very touch. The sweet-scented clover field, the waving grain, the rustling corn; have they no charms except to the painter and the poet? Some men have the same warm passion for ploughing that others have for preaching. It is their gift, and one not to be despised. No, to be honored rather. A creative genius lies in it. Some hold that, in order to make farming a success, one must think only of what gets his scythe and keeping the rails up. Or, if he admires a cow or a pig, it must be only from a moneyed point of view. I have no such theory. I can see no reason why it does not relax the mind, and sit a man for better labor on the farm, to listen to the larks in the morning, and the whip-poor-wills at night, as well as in any other profession. Then the farmer stands knee-deep in a clover field. A true one will think of something besides crowding the hiring just ahead with the point of his scythe to get an over-day's work. Let him swing his scythe gracefully, steadily; and, if it pleases him, let him watch the clover heads as they fall, and thank God that He made them grow so large, and smell so sweet, and look so beautiful. Just that thought will rest him. If you have a passion for farming, let no false pride deter you from it. If you belong to a family of six boys, and all of the rest take to professions, it is no reason why you should. Someone of you ought to stay on the farm. If you are the hardest, you are the one.

I am in a farm-house now—a still old homestead—which once was filled with the merry laughter of childhood. Gradually it settled down into the mature thoughtfulness of manhood and womanhood. And now it has died out altogether. The children have gone, one by one, and the old folks are alone. Any place seems terribly still and solemn after a gay party has just gone out. To father and mother it seems but yesterday that the children left for good, and the stillness grows stiller as years go by. Each yesterday seems sadder than the one before it. In this old homestead I have romped with the children, talked of ribbons and bows with the grown-up girls, and had a finger in all of the wedding cakes. Why did not one stay? The house is well furnished; everything looks comfortable and tidy. Yes, too tidily it looks. Everything is set back against the wall. There is no confusion in the dressing-rooms. Every book in the library is placed where it belongs, every paper folded, and not even a noise in the whole house. The chambers—how orderly they are! They were never so when the girls and I rummaged them. There is not even a rag sticking out of the bureau drawers. I wouldn't stay in this house alone for any thing. Let me down stairs quick! There is aunty in the garden, gathering sunflower seeds, and uncle in the woodshed shaving kindlings. How lonesome they look. I don't wonder. For six weeks not even a letter has come to break in upon this dreadful stillness. Well, I must go too, I can't stay if their own could not. The fields are lying waste, the fences and roots falling, and that old couple going to their graves, as it were, childless, because the boys all took to professions, and the girls to professional men.—Mrs. B. C. RUDE in *Rural New Yorker*.

Sugar from the Soft Maple.

Editor *Canada Farmer*:

Sir, — In looking over a little book, by a Canadian authoress, Mrs. Traill, the other day, I came across a statement, that the sap of the soft maple does not yield sugar. When this lady wrote these words she only expressed a belief shared in by nearly the whole of the rural population of Canada, as I find that her view is held by all with whom I have conversed on the subject; some even go so far as to maintain that good sugar cannot be extracted, under any circumstances, from the sap of the soft maple. Until very lately I held that opinion, also; but last spring a friend of mine, who lives on a new bush farm where maples of that kind are very plentiful, tapped over two hundred of them; he did not tap a single hard maple, for the excellent reason that there were none to tap within easy distance of his camp. The reward of his labor was 250 lbs. of really the finest maple sugar—and I have seen a good deal—that I ever saw. The only feature connected with the manufacture of it that he noted was, that it required a little more sap to yield a certain quantity than of the sap of the hard maple. He intends to tap 100 additional soft maples next spring, and is confident of a good yield and a first-class sample.

SACCHARUM.

Chatham Township, Nov. 4th, 1873.

Grasses and Forage Plants.

Orchard and Tall Meadow Grass.

Mr. W. F. Tallant, who is a man of some reputation in his own country, Montgomery, Va., thus writes on the above subjects to the *Albany Country Gentleman*:—On these two grasses the foundation of all farming should rest. As long as we have them, I do not think we should ever sow any other grasses, save possibly a little clover to mix with them, which will die out as the orchard or oat grass thickens. Orchard grass, with us, is ready to cut by the first week in June. It will grow more in one week (after cutting) than blue grass will in a month. It makes a larger aftermath, and makes it quicker, than any other grass I know of. Land will improve with a sod of orchard grass (or any other kind) on it, no matter how you treat it. It is the most profitable crop we can raise, as a general farm crop. I will try to give the reasons for my belief.

The first of June is generally the most convenient of all times for cutting hay—before wheat harvest and after planting. Timothy comes in so near wheat harvest that it is often left until that is over, when it is entirely too ripe. Orchard grass will grow more in one week than blue will in a month—I have Flunt's word for it, as well as my own experience. I have tried it on rich and poor land, and the aftermath has always been heavier (weighs more) than any other grass that I know of.

I have stated that land with a good sod on it will improve. I have never seen or heard of a sod of orchard grass that did not steadily improve, if not pastured. What I mean is, that a sod of orchard grass may be mown as often as you like, and everything removed from the ground; or it may be allowed to go to seed, and then the seed, and the grass under it, both removed, and yet the sod will continue (if all weeds are carefully kept out), to thicken, and produce more hay or seed, year by year. It is impossible for the grass to make more and more hay unless the ground is improving.

Within the last few years, several old fields have been broken up in my neighborhood, that have been neglected for twenty years or more, with cattle enough on them to eat up every blade of grass that ever got 2 inches above the ground. Blue grass sod formed over them, and so the fields remained. One of these fields brought 50 bushels of corn per acre, without manure of any kind. On the others the corn was also fine, but I do not know how much. These fields had certainly improved. That a field will improve faster when everything is mown from it than when everything is grazed from it, I know by my own experience, and any one may be convinced by trying two fields, side by side, a few years. I may mistake, but from all that I can see and learn, I am convinced that land which has a sod or grass on it will slowly but steadily improve. It will certainly not get poorer, no matter how often mown or how closely pastured.

I now come to my last statement—that orchard grass is the most profitable general farm crop we can raise. My system for its management is as follows: For hay, mow first week in June—a little sooner than most people mow. Mow again about Sept. 1. What grows after that I let stay on the ground as protection to the sod during the winter and for mulch the following summer. If I leave for seed, I cut the seed; then immediately cut the bottom for hay, leaving all that grows afterward on the ground, and never allow a hoof to be seen in my orchard grass fields. Cattle, instead of being the making of our farms, as most people imagine, are the ruin thereof. If people will keep cattle, let them soil. If I can help it, I never intend to allow another head of cattle to go out of my barn yard. Where land is worth \$50 an acre, no one can afford to keep cattle otherwise than by soiling. But to return to my orchard grass. The profit on good land is about as follows: You get one and one-half tons of hay at each cutting, making three tons per acre; with us hay is worth \$16 per ton; thus each acre brings \$45. The expense of cutting and stacking is 2.50 per ton, or 7.50 per acre, which leaves us \$37.50 per acre clear. The seed, with the hay cut immediately after, will probably

pay as well. What crop will pay so well, keep up the land, and give us as little trouble? In sowing for hay, I like to sow 2 bushels of orchard or oat grass, and one gallon of red clover. For seed, leave out the clover.

Tall meadow oat grass and orchard grass are very much alike in all respects save appearance. The oat grass, for hay, yields more, but is not quite as good in quality for seed; it makes more seed, but does not bring quite as much per bushel here. What I have said about orchard grass is equally true of tall meadow oat. I think the oat does best on poor land. Persons sowing orchard grass must not expect too large a crop the first year. Like many other grasses, it takes two or three years to come to perfection. I generally sow in March, but where the winters are not too severe, it is best to sow the last of August, or not later than the 10th of September.

Stacking Corn-Fodder.

Considerable care is required to stack corn-fodder in such a manner as to prevent waste. It requires not only to be put up so that it is safe from the weather and the ravages of vermin, but that a part may be taken down for use without exposing the remainder to damage. In the ordinary stack the fodder is taken from the top, and when a part is removed for use the rest of the stack is left without covering. A stack built upon the ground immediately becomes the prey of innumerable rats and mice, by which it is not only cut up and destroyed to a large extent, but what is not directly destroyed is so soiled as to become almost unfit for use. Now that the value of the corn-fodder is becoming more widely recognized, means are to be taken to preserve it more



Elevated Stack for Corn-Fodder

effectively. In very rare cases is there room beneath the barn roof for it, and it is necessarily stacked out. As we have pointed out, the making of such stacks as can not be removed for use at one time is objectionable, as is also the plan of making a quantity of smaller stacks by which a much greater proportion is exposed to injury. A long stack, built in sections, which will contain the whole supply, is preferable to any other plan that we have tried. It may be built along the north side of the barn-yard, or any other exposed side, and made to serve as a valuable shelter. By setting posts in the ground, as shown in the engraving, and placing beams or poles upon them with a loose flooring of rails as a foundation, the double purpose may be served. The open bottom giving free access for air will tend to ventilate the stack, and if an opening be made, either by placing a few rails fastened together in the centre, or by placing the bundles a few inches apart in the centre, there will be no danger of the corn becoming mouldy. The posts should be dressed smoothly so that vermin can not mount them, and if they do succeed in gaining a temporary occupation it will be soon terminated if a cat is allowed to range around the premises. The space beneath such a stack may be made useful, instead of being a hiding-place for unclean beasts and for hens to lay where their eggs are lost. The stack is to be built so that the bundles of fodder do not bind length ways, and that it may be opened at one end and taken down piece-meal, as indeed it is put up. Each day's supply may then be thrown down and no part of the stack can be exposed long enough to become injured.—*American Agriculturist*.

Implements of Husbandry.

Take Care of Your Implements.

An intelligent farmer observed to us the other day that the amount of money he had annually to expend in purchasing new implements and repairing old ones was, to use his own phrase, "purely preposterous."

We questioned him for a few minutes and found his replies at once so candid and instructive that at the close we congratulated him on the smallness of his expenditure. He told us in the first place that whenever he was through ploughing, whatever the season, he left his plough sticking in the ground at the end of the last furrow, and there it lay until required again for use. Every plough about him, he informed us, remained in this manner out of doors all winter. The same with his harrows, scuffers, cultivators, drills, and even his mowers and reapers.

Now we know this to be a very common occurrence amongst many, we had almost said most of our farmers, and in view of the fact, instead of the expense being complained of as "preposterous" we hold that the complaint itself is utterly preposterous.

Leave a plough out under the weather for any length of time, and what will, what must be the result? Rain comes to-day and the woodwork is all swelled up—the joints literally bursting. To-morrow comes the sunshine which not only dries up the water absorbed but also corrodes and disfigures the woodwork to the inmost depth of absorption. Let this be repeated several times, and we soon have a rough, rickety, cracked affair, loose and creaking at every joint and in fact almost utterly useless. All the time too the atmosphere is rapidly oxidizing the parts exposed of the iron-work—eating deeper and deeper into it every hour. And if this is the case in spring, summer, and autumn, how much more are these injuries supplemented by the keen frosts of winter. Extend the reflection further to the larger area of the cultivator or reaper, and the injuries of course increase with the extent of surface exposed. Leading agriculturists, after long experience, assert that such a course of treatment shortens the duration of an implement by about one-half, that is to say, a reaper which would last ten years with this rough usage, would be good for twenty years if properly cared for. What then is the proper mode of treatment? It is very simple and entails but little extra trouble. Keep your implement constantly under cover when not in use, and if it happens to be wet or muddy, clean and dry it thoroughly. And again, when laying it by for the season, rub off the metal portions thoroughly and grease them; don't stint it, give them a good thick coat, and in the spring you will find your plough, mower, or whatever it is, nearly as sound and fresh as when new.

Potato-Bug Catcher.

A novelty in shape of the above was shown at the last London Exhibition.

There was no opportunity at the time of testing it practically, and therefore we cannot say how well or ill it would perform its destined work, if indeed it would perform it at all. Still the thing looked feasible and the exhibitor declared it a most successful article.

It consists of two wooden handles, running by a wheel between them in front just like a hand-barrow. The axle of this wheel juts out beyond the shaft several inches to the right where a pinion is attached.

This pinion works into another fastened on the end of a shaft which extends backwards in the direction of the right handle but a considerable angle to it. Near the rear end of this shaft four fans are attached which revolve along with it, and just beneath the handle hangs a box in such a manner that the edges of the fans in revolving jut in very freely over its

side. The affair is worked by simply wheeling it along between the ridges; the fans catch the tops to right and bend them suddenly inwards over the box, when the bugs drop in and there they are safely housed to await future tortures according to the whim of the operator. It is light, simple and cheap, and if at all what is professed for it, must save an immense amount of tedious labor.

Root-Cutters.

Roots fed whole, especially turnips, are attended with great danger. Animals have been known to choke on them and die from the effects in a few minutes. But besides this most important consideration, cut or chopped roots feed more speedily than when whole. Reason: There is less physical energy expended in mastication and in rendering them fit generally for the digestive process in the stomach, and the energy thus saved in the mouth is utilized in the stomach.

This stands to reason. Medical men counsel us human beings neither to take active exercise immediately before nor immediately after our meals, and why? simply because by doing so we sit down to eat with our system in a state of semi-exhaustion, and the stomach, partaking with the other organs of this state, is sensibly disabled from properly performing its functions. Over-exert any one organ and all suffer more or less.

Feeders, generally, are cognizant of the necessity of cutting turnips. They all do it; but how? Many with a spade, some with a hoe, others with a large butcher knife, and we have often seen well-to-do farmers, on biting cold winter evenings, sit down

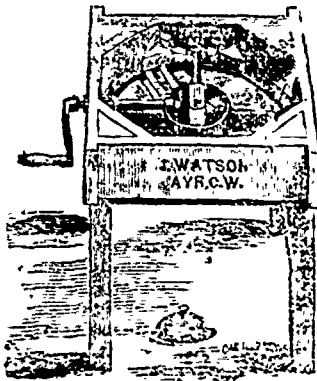


FIG. 1.

tailor-fashion on the barn floor, and with the patience of Job, cut and hack away for two mortal hours at a time, with a piece of rusty scythe blade roped to a stick for a handle.

Now these may do in a manner, that is to say, they are preferable to nothing at all, and, therefore, not to be despised where better cannot be afforded, but just consider the amount of time and labor expended in their use, and after all, what an utter lack of uniformity in their work when completed.

The Root-cutter is intended to supersede all these efforts and remedy their defects, and it is but a poor economy that would urge a rigid adherence to them when the other can be procured. Especially is this the fact when the roots are to be prepared for sheep, for the amount of hand-cutting then is simply enormous.

The best of English Root-cutters may now be had of Canadian manufacture; and besides them, there are some other excellent ones of Canadian invention.

A cheap, simple and very serviceable implement of the latter class is illustrated by our first cut. It consists of a square box braced firmly on four wooden legs. Two iron bars or ridges cross the centre of the box, from side to side, cutting each other at right angles, and the bottom of the box, which constitutes the cutting apparatus, is made to revolve horizontally. This bottom consists of a heavy, circular, cast-iron

plate—heavy enough to acquire considerable momentum in revolution, and in it are inserted two knives, adjusted so as to slice anything resting on them above. The turnips are thrown in. Their own weight, of course, keeps them constantly pressing downwards. The handle is turned and the bottom begins to revolve, carrying the turnips along with it until they are stopped by one or other of the cross-bars, when the slicing process commences, each piece, as it is separated, falling directly under the cutter. A heavy fly-



FIG. 2.

wheel opposite the handle enables the operator to turn it with ease. This is an excellent little implement, and very popular with those who have used it.

For more extensive use, the best machine now in the market, is of English invention, and generally known under the name of Gardiner's Cutter. The distinctive feature of this machine, and that which marks its superiority over all others, is the construction of its cylinder, which is of barrel form, made of metal, and equipped with steel knives, set at uniform distances along its convex circumference. Two of these knives are simply blades, stretching across the whole width of the cylinder and are designed solely for slicing. The others are arranged in a series of rectangular little blades, the edge of each being slanted

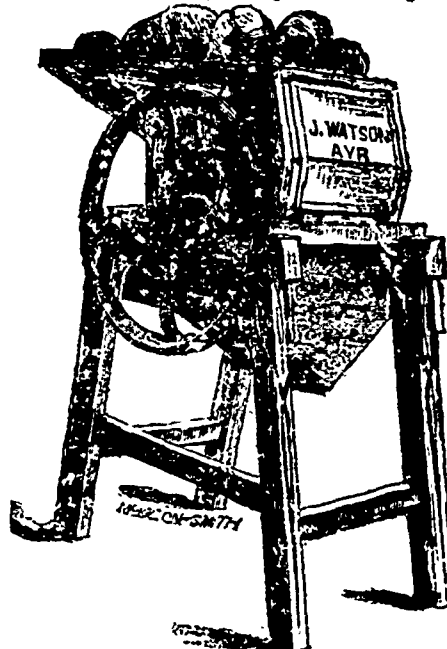


FIG. 3.

like two sides of a square, and their use is to cut up the roots into strips from five-eighths to three-fourths of an inch square. The iron grating seen in front,

prevents the turnips, &c., from slipping when the machine is cutting. When cattle only are to be supplied, the handle is turned in the ordinary way, and the roots are sliced off, each piece, as in the former, falling under the cutter. When, on the other hand, the feed is to be prepared for sheep, the motion is simply reversed, when the smaller or stripping knives are called into play. This machine may be driven either by hand or power. It is, of course, considerably more costly than our first, but then the perfection and quantity of its work are such that we cannot see how any stock farmer can get along well without it. It will pay for itself in a single season, where many head of cattle are to be attended to.

Our third cut illustrates what is known as the "American" Root-cutter, which is preferred by some on account of its cheapness. It is got up on much the same principle as Gardiner's, does its work very well comparatively but is considerably smaller, and costs only about half the price of the other.

The "Gardiner" machine, mentioned above, is, we might add, the one which took the large medal for the "First degree of merit," at the late International Industrial Exhibition, held at Buffalo.

Improved Implements.

A discussion was had at the evening meeting of the New-York State Agricultural Society, Sept. 29th, on the "Benefit of Improved Implements of Agriculture," and was opened by Hon. GEORGE GEDDES, who read the following suggestive paper:—

"In 1851, the first world's fair was held in England. At this fair, American harvesting machines and American plows took the prizes, and then and there it was demonstrated that grain could be cut by machinery better and cheaper than by the hands of skilled farm laborers. In 1852, the New-York State Agricultural Society held at Geneva in this State, a trial of all the various implements, except plows, that were then offered by the manufacturers for the use of farmers. The trial was exhaustive, and really marks the year from which we may date the rapid march of improvement. There were then shown all the important reapers and mowers that had been invented up to that time, and though the committee was very much astonished at the excellence of the machines, and commended them to the public in very decided terms that certainly were fully justified by the trial, yet as one of that committee, I now say that the best reaper and the best mower there shown, have since been so much beaten by other machines that to-day no good farmer would accept as a gift the premium machine of 1852, any sooner than he would accept on the same terms, one of the Bull plows that were thought to be good tools before Jethro Wood invented the cast-iron plow. At Geneva, the inventors were brought, with their machines, face to face, and each saw where and just how his machine failed, and where some other excelled. The immediate consequences were greatly improved machines, and to this day improvement has been continued.

At first the reaper had but little advantage, except in doing its work better, over hand labor. The cost of harvesting an acre of wheat was but little less when a reaper was used than it was when the old grain cradle was employed, and it was not until there was connected with the device for cutting the grain, others for delivering it in gabels by the power of the horses, that great economy as well as more perfect work was secured. And up to the date of that improvement there was a constant effort to produce combined machines, that should both mow and reap as occasion might require. But the "Self-Raking Reaper" made the harvesting of grain as much less costly in manual labor, as had the mower made the business of securing the hay crop. Now the reaper or mower will easily do the work of six men who use the tools that were in universal use before the year 1852. That is to say, a man or even a boy and a pair of horses, now do as much work with a machine, and do it vastly better in cutting grain or hay, than did six strong men twenty years ago. These cutting machines are followed by other improved machinery that very much lessen the work of securing the hay and grain crops.

One result of this improved machinery is a demand for more mechanical skill in the management of a farm. The mere laborer perhaps, has less general knowledge now than most farm hands had a quarter of a century ago. An immigrant just from over the sea can soon be taught to bind grain and to handle hay tolerably well if he tries. But he must have a very well qualified teacher.

While the American plow and our tools for mellowing the soil and sowing the seed, are the best of any in the world, the expenditure of human labor up to the harvesting of the crops, and in the manufacture of butter and cheese, is not essentially less than it was before the great improvements made in some of the most important implements of agriculture. Still there are less men now employed in proportion to the whole population, in producing food, than there were before the year 1852.

The census tables give this reduction at about one-third, as stated by a late writer in the *New York Times*, Alex. Delmar. While the work of haying and harvesting is lessened more than this proportion, yet it is not probable the whole of the labor of the farm is lessened more than one-third. The question arises, who is most benefited by this cheapening of the food and raw material for the clothing of the people? The price paid for farm labor, when reduced to the gold value of the money paid, is quite double the price paid for like service thirty years ago. So the first benefit of the improvement of machinery inures in this case to the laborer himself. For the employer pays more extra compensation to his men than is saved by the improvements in implements. The prices of the products of agriculture are larger than they were thirty years ago, or the producers could not pay the prices now ruling for labor.

But the effect of this doubling of the compensation of agricultural labor and liberating one-third of the persons formerly employed, and giving them to other industries, is felt in all branches of business. The laborer now has money to provide his family with comforts unknown in his mode of life thirty years ago. The immediate consequences of this plenty of money with people who will work, are better education and more independence and elevation of character. Savings Banks have larger deposits, merchants sell more goods, and all branches of business are quickened. But a very serious objection has been made by Mr. Delmar, in his articles in the *Times*, to the influences of the improvement of the implements of agriculture, and that is—over production of the grain crops. We are told that the population of North America is 52,000,000, and that 16 bushels of the cereals is all that can be consumed in a year by each individual—all branches of consumption being taken into account, including the amount converted into liquors, starch &c., and the amount fed to animals, and he gives the quantity of the cereals produced by this population at 1,725,000,000 bushels in the year 1870, which is 35 1-5 bushels each, and he says that the farmers of United States alone considered, produce 40 bushels per capita of the whole people, which is 2 1/2 times their power of consumption.

This calculation like many others based upon census returns, is manifestly erroneous, for 1870 has been so long past that by this time we should know exactly the effects of such over-production upon the prices of grain. Since 1870, the crops have been reported as good, and by this time there would, by such calculations, be on hand an inconceivably immense quantity of unsaleable grain. For it is now claimed that we export only a very small percentage of the crops produced in this country.

Mr. Delmar says he "learned in his late tour in Europe, in the character of delegate to the Statistical Congress, and from other sources, that the world is to-day producing more bread than it can eat," and he says that "we, as one of the principal grain-producing countries of the world, are large participants in an overdone industry, and the sooner we abandon the policy of endowing agricultural colleges and turn the minds of our children rather to proficiency in mechanics, the better." This is the first that any of us have heard of there being any danger of over-production of food growing out of anything that agricultural colleges are doing.

These alarming figures have frightened the learned Doctor of Divinity who edits the official organ of the most numerous denomination of Protestant Christians of this country into saying: "It is plain that, in a merely commercial sense, agriculture is an overdone form of industry. In the parlance of the street, farming does not pay—cannot be made to pay," and that "there is great danger that this superabundance of material wealth, if not employed for some higher purpose, will lead to habits of luxury and dissipation that can result only in the utter demoralization of society."

I cite these speculations of men of figures to show that the improved machines of agriculture are charged with vast responsibilities—even the ruin of the nation by feeding the people too well.

To allay any fears that may have been caused by these alarmists, let us say that there certainly is no such surplus of food, nor has there been, as this manipulator of figures says there was in 1870. For if such an excess of twenty-four bushels per capita

had been produced, it must either be stored, with the crops since raised, or exported to other countries. If it was yet here, the prices of grain could not be as high as they are. To export such a surplus, calling the average weight per bushel fifty pounds, would employ 5,700 ships carrying 1,000 tons each, and taking each four loads in a year—for the total weight of such a quantity of grain would not be less than 22,800,000 tons, and would fully tax all the trunk-lines of railroad and all the canals, to the exclusion of all other business from the west to the east.

We have heard much complaint of the high prices that manufacturers of implements and reapers put upon them, and of the resulting too large profits that they receive.

Let us look at this matter and inquire whether the public at large has not received a full compensation for all the profits made by the manufacturers, in the stimulus given by the expected rewards to improve and perfect these machines? The improvement has certainly been very rapid, and great perfection reached in a very short time. To introduce these machines it has been necessary to employ very skillful agents, who, in many cases, have taken their machines into the fields and almost forced them on reluctant buyers, by showing them that they could not afford not to buy. Such agents must be well compensated. But going before this is the great expense attending the construction and perfecting of a machine that is so good as to justify a farmer in its purchase, in cases where he has on hand a machine that is but partly worn, and that but lately was considered as among the best made. And, too, we are to consider the money lost as well as made by men trying to excel all that has gone before them. Very soon the ownership of these inventions will be in the great public, and then the vast benefits that have resulted to the world from the invention of these machines will be further enhanced by free competition in their construction.

It is common to say that but for the improved implements of agriculture, farming could not be carried on. This is a hasty statement, and is not true—for the business of food raising must of necessity always go on. People will consume food and wear clothes, and they will pay whatever sum may be found necessary by actual trials to cause somebody to do the work required to produce food and raiment, and this work will necessarily be sufficiently remunerative to make it pay even in the parlance of the street—and we assure the editor of the *Christian Advocate* and all other anxious men, that farming is sure to pay, and perhaps it is the only business that is sure to pay, as long as human events remain as they are. It is true it takes some brains to win in a business where there is so much competition, and the rewards of the best industry and the highest skill and best economy in the use of the most improved implements, are not so great as to make our over-production of material wealth entirely demoralize the nation; and finally it is safe to say that if no machine had been improved within this generation, the necessary food for all the people would have been produced, though at a much greater cost of human labor, and either that labor would not have been as well paid as it is now, or the prices of its products would have been much higher than they are now. The inventors and manufacturers of agricultural machinery may safely be allowed to go on improving, and the policy of endowing agricultural colleges may safely be allowed without fear of ruin or demoralization.

Farmers' Grindstones.

Premising that the grit is of the right kind for an axe or a scythe, a good grindstone will be set to run smoothly and perfectly true; its face will be neither hollow nor round, and the water supply fresh, and not more than for the occasion. The water-trough, being often made a part of the frame or bed, should be provided with an outlet for water, that the stone may not be left standing to soak therein, by which one side becomes softer and heavier, from which cause it runs with irregular speed and wears, unequally. Water is indispensable to protect the temper of the tools, and to keep the grain of the sandstone clean from the small particles of sand and steel detached by friction.

In applying the tool to be ground, the pressure must be varied in proportion to the width of the tool; and the effect will be very much varied by the direction and speed of the stone, being more when moving toward than from the tool. In the latter case, however, the edge is more liable to catch, and thereby to

damage both itself and the face of the stone, while in the former, a wire-edge is thrown up as soon as the bearing or convexity of the tool is ground off, and only an experienced hand may safely practice it. Stop short of this point, and finish by changing the angle of contact of tool with the stone. But in grinding chisels and plane-irons, when the edge is turned by one plane and one bevelled side, there is a kind of traverse motion to be kept up, which contact over the whole of both surfaces preserves them nearly straight and plane. The finishing edge, as of finer tools, seen on new knives, razors, &c., is brought out by a finer stone, where the tool is held at a more obtuse angle.

The difficulty of applying a rest to a portable grindstone (as to a lathe) exists in the uncertain wear and unequal use of its surface, by which the true cylindrical form is soon lost. To avoid this, a lateral motion must be given to the tool, utilizing the whole face of the stone, which is especially necessary in applying the face of a common or a broad-axe, as well as a plane-iron, and, as may be apparent to any one, in grinding carpenter's gouges, a cape-chisel, or, indeed, any metal-worker's tools. It was well said "show me the grindstone, and I will tell you the character of the shop;" and it may be said the character of the workmen is thus shown elsewhere, even on a farm.

With one who has had but little practice in setting tools the common error is in not holding them flat enough to the stone (whether grindstone or oil-stone), and thereby producing a convex side, and at the same time being liable to "check" the stone and turn the tool—perhaps worse, wound himself. For this, practice is the only remedy. With a little ingenuity, a rest is always possible to be applied, but the efficiency is in most cases very doubtful. Better trust to the wrist and right hand as a movable chuck, while the fingers of the left hand placed on the upper face of the tool will control its pressure, and be the guide-rest. Don't forget to leave the stone out of water, as well as to dry the tool, if not even to oil it when laid aside.

The grinding or setting of a cutting-tool may be simple enough; yet there is but one way of doing it perfectly, that the cutting edge formed by a definite angle of two surfaces shall be exactly reproduced. There is a knack in perceiving when this edge has come, and in not over-doing, or producing the turned or wire-edge, which practice only can acquire. From a knife this can be removed by drawing across the thumb nail; from other tools, by rubbing across a piece of soft wood. But a greater difficulty from repeated sharpening, is to avoid in time the formation of two convex surfaces, which would be better if flat, or even concave slightly, as when the tool is new. Even a new axe is never convex all the way to the edge, but within a sixteenth of an inch of the edge takes from each face a special bevel, which is the edge.

Straight-edged tools, like chisels, when being set on the oil-stone, are best held in such a manner that the motion of the hands is nearly at right angles to the line of the cutting edges. Concave faces are produced by stones shaped for the purpose, but they do not come within common use.—*Cor. Country Gentleman.*

PROTECTION OF IRON FROM RUST.—The following mixture is stated to be an excellent brown coating for protecting iron and steel from rust. Dissolve two parts crystallized chloride of iron, two parts chloride of antimony, and one part tannin, in four parts water, and apply with a sponge or rag, and let dry. Then another coat of the paint is applied, and again another, if necessary, until the color becomes as dark as desired. When dry, it is washed with water, allowed to dry again, and the surface polished with boiled linseed oil. The chloride of antimony must be as nearly neutral as possible.—*Engineer.*

HYDRAULIC RAM FOR RAISING WATER.—The following rule may be found useful for calculating the power of a hydraulic ram. Theoretically, the number of gallons per minute delivered would equal the number of gallons per minute passed through the ram, multiplied by the height in feet of the available head, and divided by the height in feet of the point at which it is required to deliver. The actual performance of a well-proportioned ram when new and in perfect order should be about 60 per cent. of this quantity; but for an average can hardly be reckoned at more than 50 per cent. If the water is liable to be dirty at times, it should be passed through a filter before going through the ram. With clean water I have found the "pulse" valve required renewal or refacing after about twelve months' constant work, and the brass "ball clack" to "rising man" after about six months; but this would vary with the size and the height to which the water was thrown. In my case the height was 109ft.—*Field.*

The Dairy.

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

Creameries.

Butter factories and creameries differ in this, the former only make butter, the latter makes butter and cheese. Creameries are carried on with two distinct purposes, or modes of operating. The design of one class of creameries is to take off all the cream that can be obtained without actually souring the milk, and making from the stale milk an inferior quality of skim cheese, with the hope of getting better returns than from feeding it to calves or pigs. In the other class of creameries the purpose is to take off no more cream than will allow of making a good or at least a fair article of cheese from the skim-milk. The build-

ings and apparatus for the two purposes are necessarily different. In the former plan, a butter factory and a cheese factory combined are necessary.

These creameries are constructed in a great variety of forms which are made to vary according to the particular location, and the fancy or different purposes of the buildings.

Perhaps no single plan, however well arranged, would be best under all circumstances. Yet there are certain requirements which run through them all, and which may be described in general terms, and contained in one comprehensive structure.

One of the best designs for a creamery of this class was presented to the American Dairymen's Association at its convention in 1872, by H. Cooley Greene, of Woodcockboro', Crawford Co., Pa. It was drawn on a large scale for exhibition at the convention; a plan of it greatly reduced is herewith presented.

Upright 24 x 60 feet; wings each 24 x 40; ground descends towards the right and rear; R, R, receiving room, 3½ feet above the floor of main building; P, P, P, pool in three apartments, separated by 3-inch plank, which are tied by a cross plank 10 inches wide; the milk-room opens by sliding doors to the vatroom, V, R, which is open to press-room and churn-room, C; B is walking beam with arms for attaching sixteen churns. Motive power in engine-house, E; D, curing-room for new made cheese; S, store-room; O, office; W, wash-room; S, sink on castors; V, verandah with pail racks; P, steam jets for scalding pails, churns, &c.; E, engine-room; T, T, water tanks, lower one for cold and upper one for hot water, with faucets in either room; T, trap for elevating butter from cellar, which is under left wing; A, A, A, are traps to drain for slops; I is drain for whey and buttermilk. All liquids carried beneath the floor; O, R, open platform for airing churns, &c.; second floor devoted

to curing rooms, separated by rolling doors at each aisle.

The first consideration in locating a creamery, after securing a supply of milk, is a plentiful supply of pure water from a cool spring or well, to control the temperature of the milk just as desired. This is a

In the successful working of a creamery, drainage is a matter of primary importance. It is more difficult to secure pure air in a creamery than in a butter factory as there is more wash in the former and the addition of whey to dispose of, and unless the air is kept pure where the milk and butter stand, the butter will be faulty in flavor and keeping quality. It is an important item, therefore, in locating a creamery to place it where all the waste can be easily carried out of the reach of the buildings. The size and interior arrangement of the creamery building will be sufficiently understood by an inspection of the cut, and from the explanation by reference to letters. The cream vat is a new feature. It is constructed on the same principle as the common cheese vat, and is designed as a storage for cream, where it can be thoroughly mixed and warmed or cooled as desired, by steam or water connections.

The pools are made either of plank or cement, and are large enough to contain the milk of four or five milkings, and should be divided into so many departments that each mess of warm milk shall stand by itself, so as not to change the temperature of that already cooled. They are made deep enough to have the water reach within an inch or so of the top of the coolers. The apartment in which the pools are contained is made with tight walls

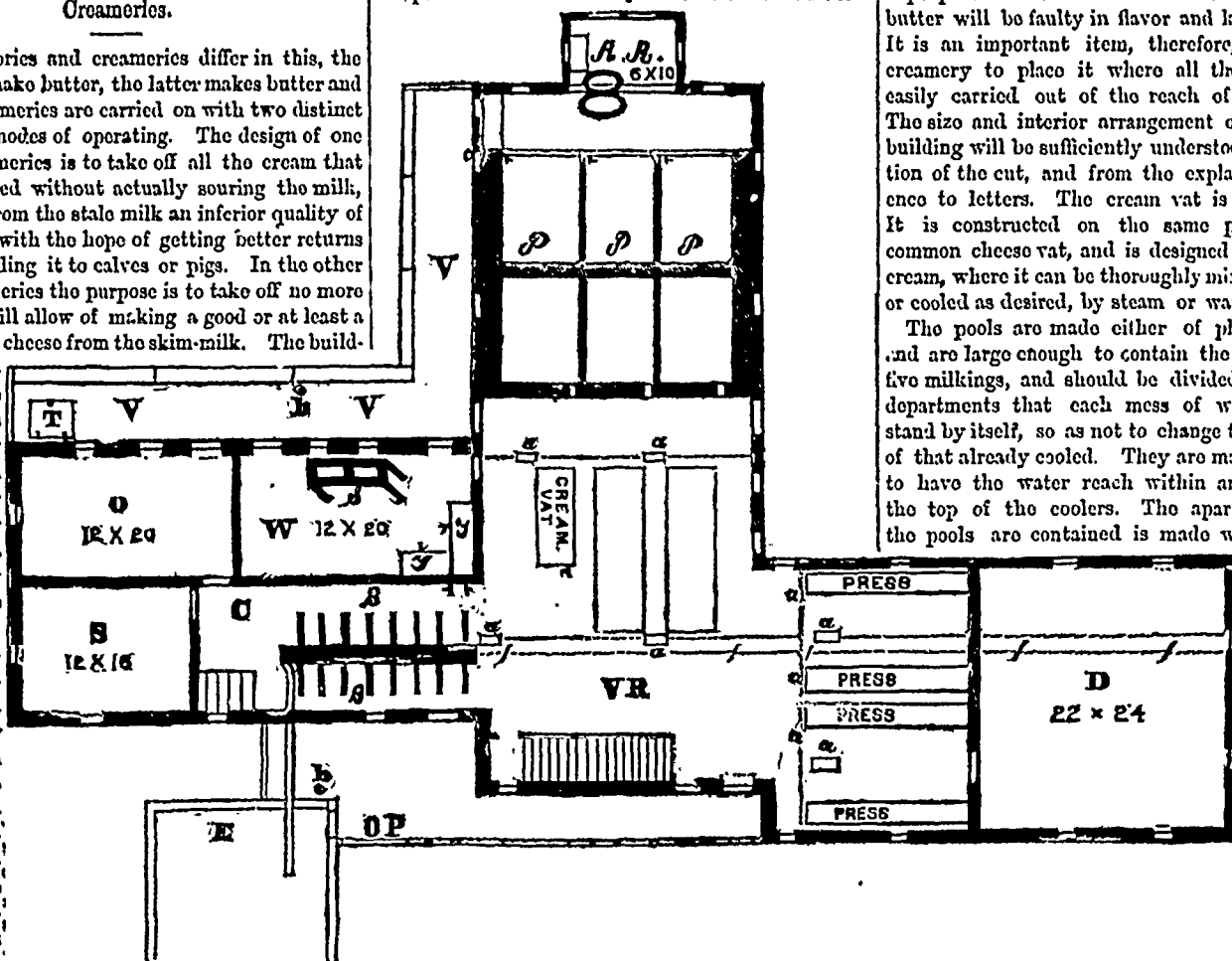
so as to guard against currents of air and sudden or rapid changes in the temperature of the room. It is preferred to keep the temperature of the air in the room as even and as low as it conveniently can be, and the light pretty

well shut out, both on account of flies and from its effect in fading the cream while rising.

It is the custom in creameries that make butter a leading object to use only cooler pails to keep milk in while the cream is rising. These coolers have been described in a previous number as being tin pails about nineteen inches high and nearly eight inches in diameter. They hold about fifteen quarts each, and are straight-sided or cylindrical in form.

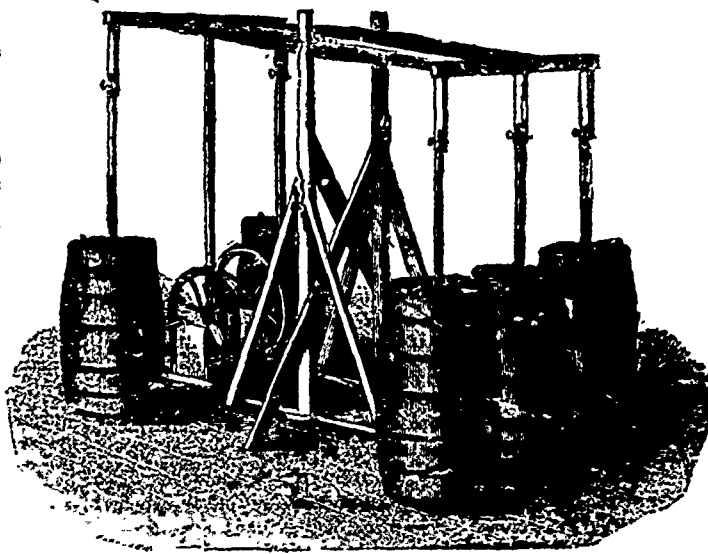
When the milk is brought into the creamery and weighed, it is usually discharged into a receiving vat, where the milk of several patrons is mingled together, and from this vat it is drawn into the coolers and set into one of the pools to be cooled down to 58 or 60 degrees. The coolers are not filled full. Enough is put in each to have the top of the milk in them about an inch below the top of the water that surrounds them. This ensures perfect cooling. The rapidity with which milk is cooled to a desired standard varies very much in different creameries according to the fancy of the operators.

In the different establishments we have inspected, the time in which the cooling is done, varies all the way from one hour to twelve. When the coolers, filled with warm milk, are set into the pools, the milk within them, and the water that surrounds them, soon assume very nearly the same temperature. If now only a small stream of water is let into the pools, the warmed water will be very gradually displaced and the cooling slowly done. The process is hastened by admitting a larger stream.



Model Plan for a Complete Factory for 500 Cows, by H. Cooley Greene.

sine qua non, as not to be able to cool the milk at the proper time, and to keep it at a proper and uniform temperature, would be fatal to success. The quantity of water required will depend somewhat on the temperature; the colder the water the less will be needed. With water at 50 degrees a cubic foot per day for each cow will do very well, though a larger quantity might be desirable. The next thing,



Dash Churn.

after the water, is a proper site for the buildings. They should stand on a dry and airy place and high enough to allow of ready drainage, so that all the whey, buttermilk, and wash, may be conducted to a safe distance.

The effects which follow the fast and slow cooling are unlike. The milk will keep sweet the longer with the rapid cooling, but the cream will rise more rapidly and the butter will be better where the cooling is more slowly done. The objectional odor of new milk requires several hours to pass off at ordinary summer temperatures. The higher the temperature the sooner it flies away, and the cooler it is, the more slowly it is removed, until it ceases entirely to escape and remains permanently in the milk and cream. It is thence carried into the butter to the injury of its flavor and keeping, as we have before explained.

One of the best operators we have met with is Mr. John Higgins, manufacturer in the creamery at Speedsville, Tioga County, N. Y. Mr. H. is an expert in judging of, and handling butter, and a close observer of the causes that affect it, and a sketch of his operations will give as good a representation of the results of creamery practice, as can reasonably be expected.

The water used in the Speedsville creamery has a temperature of 50 degrees. Upon the arrival of the milk, a pool is filled with fresh water, and coolers are filled from the receiving vat as the milk arrives, and placed in the pool and water enough turned on to cool it down to 60 degrees in 10 to 12 hours, Mr. H. being an advocate of slow cooling. In warm weather, it is skimmed at 36 and 48 hours old, and the cream, in coolers, set in a pool at 65 degrees where it stands 12 hours and, becoming slightly sour, is churned in one-and-a-half-barrel dash churns, worked by steam as shown in the annexed cut.

The skimming is done by removing the cream with a conical quart cup made of tin, with the pointed end down, and is used with a perpendicular handle. It resembles a funnel with a long upright handle. When the milk is ready to skim the pointed end of the cup is pressed down into the cooler till the cream, which is always sufficiently soft to flow, will run over the top of the cup and fill it, when it is emptied, and the process repeated till the cream is all dipped off. Before the skimming is done the coolers are lifted from the pool and placed on the floor or on a bench, where they will be convenient for working.

Before entering the churn the cream is passed through a cream strainer made of perforated tin, of the form seen in Fig. 3, by which means it is thoroughly mixed and all the lumps made fine and flies, and any other foreign matter separated. The temperature observed in churning is 60 to 62 degrees; the cream being cooled down to 60° before removing it from the pool.



FIG 3

As much cream is put in each churn as can be, and allow the dash in its upward stroke to rise above it. The dashes are made large, so as nearly to fill the churn at its top, and bottom; their motion is at first slow, about 40 strokes per minute, till the cream is well mixed, when the motion is increased to 45 or 50. When the butter begins to come the motion is again retarded, and water enough is put in to make the contents of the churn rise a little above the dash, and to reduce them to a temperature of 60 degrees. In this way the butter is hindered from gathering into large lumps, a condition unfavorable for washing. When the butter has gathered into lumps as large as peas, it is taken up into large wooden bowls and washed till the water will run off clear, a task easily accomplished when the butter is in such small pieces.

This done, it is placed on an inclined butter-worker made of white oak plank, and 6 lbs. of salt worked thoroughly into 100 lbs. of butter, and the butter returned to the bowls in which it is allowed to stand covered with a cloth in the packing room, for 6 or 12 hours, according as it is churned in the morning or evening. It is then replaced on the butter-worker,

and subjected to the action of the lever for a short time, and then packed in white oak firkins, which have been well prepared by thoroughly soaking in boiling hot brine till all the sap and woody taste have been removed.

The practice of packing immediately after salting has been tried by Mr. Higgins, and discontinued because it did not give that "body," or solidity of texture, which was obtained by the second working. The firkins are then headed up, a space of an inch or so being left on the top unfilled. This space is filled with strong brine through a small hole in the head, and a plug laid over the hole to exclude the light. Thus treated, it will stand in a cool cellar a long time with but little change, and the only care needed till it is sent to market, will be an occasional addition of brine when it soaks, or settles away, as it sometimes does.

We tried several of the packages thus put up, and found the contents very fine, the best creamery butter we have ever met with, that had been kept so long through the heat of the season from the middle of June to the middle of September. A little defect in the flavor of the butter in the end next to the head last put in, was the only thing of any account seen, that was amiss. Mr. H. had omitted to treat the loose head with hot brine the same as he did the rest of the package, and the flavor of the uncleaned wood had made its mark on the butter that was next to it. This omission is one that is very commonly made, but it ought never to occur where fancy butter is to be kept any length of time, or indeed anywhere that strict purity of flavor is regarded.

The general quality of the Speedsville butter will be indicated by the fact that while we were at the creamery, Mr. H. received an offer for his whole summer's make, of four cents per pound above the highest quotations in the New York market at that date. The unusually fine quality this butter possessed, was due to the good management detailed, and also to the perfect neatness which prevailed throughout the entire establishment. The stale odors common to the room where the cheese is manufactured, were strenuously guarded against, and the water in the pools was changed every time a batch of milk was taken out, and the pool scrubbed with a brush, and scalded with a jet of steam.

It is a very important item to keep the planks which form the pools, as well as the water in them, perfectly fresh and sweet. Mr. H. stated a circumstance which illustrated this necessity. The water in the pool where the cream was kept, and which was alternately warmed and cooled to temper the cream, was allowed on one occasion to remain unchanged till it began to smell a little old. It was but a slight change from its fresh state, but all the butter that was made from the cream standing in it at the time, assumed the same smell and taste and became permanently injured. In accounting for the superiority of the Speedsville butter over that of other creameries, and butter factories we had seen, the condition of the milk when received ought not to be omitted, as it was better than is common. It is customary to carry milk both to creameries and factories in cans that are closely covered, so that all the animal odor it contains is shut in, and goes with it into the coolers or pans, and is condensed by the rapid cooling, and carried into the butter, obscuring its naturally lively flavor, and giving it a dull and lifeless, flat or cowey taste, that inevitably depreciates its value. Aware of the blighting effect upon the butter made from milk full of animal odor, Mr. H. made earnest appeals to his patrons to air their milk, either at the farm, or on its way to the creamery. These being in vain, he procured a supply of our milk-can ventilators, and employed a tinsmith to come to the factory and put the ventilators in the covers of all the cans he could get the patrons to leave for that purpose. Nearly all of them accepted the gratuity, and the great bulk of the milk afterwards came in fine order. In July, a few tubs of butter were nearly spoiled by tainted milk, brought in the unventilated cans, otherwise the milk was little affected by that much to be dreaded enemy of good butter and cheese—animal odor. Milk in finer condition than that delivered at our visit on Sept. 15th, we have never seen. To the combined effect therefore of good milk and good workmanship, must be attributed the superior excellence of Mr. Higgins' butter. In the early part of the season the butter was sent in return butter pails to New York as fast as made, and sold at the top of the market. During a part of the summer, it was packed in oak tubs holding 50 lbs. each, which, with oaken covers, cost 65 cents apiece. Through most of the season it has been packed in oak firkins holding 104 lbs., costing \$1.26 each.

The help required to do the manufacturing consists of two men at \$35 per month each; and one woman at \$5 per week; and one woman working half of each day at 50 cents.

No labor is done on Sunday at this creamery except to take in the milk. A cheese is made Saturday night, and the cream which would be in order for churning on Sunday is cooled down so to keep until Monday.

While the quality of the butter was excellent, the quantity, though fully equal to what is obtained in other establishments of its kind, is not equal to what is obtained from a given amount of milk in the butter factories where pans are used, showing that the use of cooler pails, or rather, deep setting, does not give as large returns as shallow setting. In the butter factories the milk in pans 4 to 5 inches deep gave 1 lb. of butter to 23 lbs. of milk, and sometimes less, the milk standing 36 to 48 hours. In the creamery, the best result up to Sept. 15th, was 1 lb. of butter from 25 lbs. of milk, which sometimes stood 48 and 60 hours. The returns of the season not being complete, the result can only be approximated by the work of a day, which gave from 6,000 lbs. of milk, 240 lbs of butter, and 315 lbs. of cheese, giving a pound of product from 10.82 lbs. of milk; 19 lbs. of milk being required for 1 lb. of skim cheese. As the churning was not done till the cream was sour, the butter-milk was fed with the whey.

The butter was made for 5 cents a pound, and everything furnished by the maker; and the cheese for 2½ cents, the maker also furnishing everything. The butter-milk and whey fed to calves and pig-netted \$1 per cow.

The gross returns for 6,000 lbs. of milk may be estimated as follows:—

240 lbs. butter, at 40 cents,.....	\$ 96.00
315 lbs. cheese, at 8 cents,.....	25.20
Butter-milk and whey of 350 cows, 1 day,.....	1.75
Total,.....	\$122.95
Making 240 lbs. butter, at 5 cts.,.....	\$12.00
“ 315 “ cheese, “ 2½ “.....	9.87—
	\$ 21.87

Total net proceeds,..... \$101.08

Net value of 100 lbs. of milk, \$1.68.
If this same quantity of milk had been made into butter of equal quality at one of the butter factories, which turn out a pound of butter from 23 lbs. of milk, it would have made 261 pounds, which at 40 cents would be..... \$104.40
Sour milk of 350 cows, 1 day, fed as above,..... 8.75

Making and furnishing butter, at 4 cts.,..... \$113.15
10.44

Total net proceeds,..... \$102.71
Net value of 100 lbs. of milk,..... 1.711
Difference in favor of butter factory,..... .027

The same milk made into whole milk cheese, taking the average quality for September, would make 640 lbs., which, at 14 cents would be..... \$90.30
Value of whey, fed as above,..... 2.00

\$92.30
Making and furnishing at \$1.75 per 100,..... 11.29

Total net proceeds,..... \$81.01
Net value of 100 lbs. of milk, \$1.35.

The whey and sour milk usually give a much better return than is here estimated. We have given the relative value in each case, supposing them to be used to the same advantage as in the creamery, for the sake of comparison. The butter factory and cheese factory would each require an investment of \$3,500; the creamery, \$4,500. A comparison of the foregoing particulars, it is believed, will enable the reader to make a fair inference in regard to the relative profits of the different ways of working up a given quantity of milk.

WASHING BUTTER.—A very large majority of butter makers wash the butter; a minority do not and claim washing is not only unnecessary but injurious. Good butter is made by some of each way of thinking—and poor also when washed and unwashed. At a recent meeting of Chautauqua Co., N. Y., butter makers the President decided the sentiment of the meeting to be in favor of careful washing with the best water to be had. Several speakers thought but little water should be used. One man is reported to have made the extraordinary statement that applying salt freely would answer the purpose of washing and that butter would dissolve no more salt than it needs. —Western Farmer.

Horticulture.

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

THE ORCHARD.

Pears.

This has been a favorable season for pears if we may be allowed to form an opinion from the unusually large quantity brought to our markets, and the usually fine appearance of the samples. All our well known and leading varieties, such as the Bartlett, Flemish Beauty, Louise Bonne de Jersey and Duchess d'Angouleme have been of good size and fine flavor. Indeed we have seen more and larger Duchess pears this year than we remembered ever to have seen before. In flavor too we think the pears have never been finer. Some of the varieties that have not yet been generally cultivated seem to deserve more attention from our pear growers, judging from their performances this year.

The *Sheldon* has been of unsurpassed excellence. With something of the vinous flavor of the old Brown Beurre, yet toned down by such a further addition of saccharine as to mellow its pungency without destroying its liveliness, and superadded to this an aromatic flavor of most exquisite delicacy, such as never was found in the Brown Beurre, it has seemed to meet every requisite in a pear of the very finest flavor. In order to secure the full measure of richness and flavor, it is absolutely necessary that the fruit should be well grown, and well exposed to sun and air. Undersized specimens, and particularly if grown in the shade will be very deficient in flavor. A difference too may be noticed in the flavor of this fruit grown on light sandy soil and grown in strong clay. That grown on the clay being much more rich and delicious than that grown in moist sandy soil.

The *Beurre Clairgeau*, on further acquaintance, is gaining in our esteem. Its fine size and handsome appearance count for something in its favor in the market and on the table. The rich ruddy glow of its sun-biased cheek, melting into the russeted yellow of the shaded side, gives it a very toothsome look. And while we admit to having eaten pears of richer flavor, we commend this pear to those who admire the Louise Bonne de Jersey as being a better and every way a more desirable fruit.

The *Beurre Bosc* is another pear not known nor grown as it deserves to be. In point of flavor it is equalled by very few pears, and to the water's taste is excelled by none, not even by the famed Seckel. Its cinnamon-russet coat is never splashed or marbled with crimson, yet there is a depth and richness in its coloring which gives promise of sterling worth hidden beneath its quaker-like garb, a promise that is kept to the letter, yes, and more than kept. Rich, sweet, juicy and aromatic, it satisfies by the delicacy of its flavors, justly proportioned and perfectly blended, never clogs by excess of sweetness or attacks the palate with aromatic pungency.

Autumnal Pears.

As the summer pears are now past, I think it may be useful to many of your readers to give them a list of a few of the very best autumn sorts. I, however, will only give comparatively new kinds, as most of the old sorts are pretty well known, and parties may wish to add something new to their collections. The following kinds have been all proved here, and found to be of the very best description; they may not, however, prove so good on other soils, and in other localities, as with me. My soil is a fine sandy loam, upon a deep sandy sub-soil, and we are situated about sixteen miles from, and about 500 feet above the level of the sea, with a fine open exposure to all the winds that blow; consequently, although geographically in

a favorable position, our trees are rendered hardy by their open exposure. I may also say that all the sorts described below were produced upon trees worked upon Quince stocks, hence the flavor, &c., may be found different from that of sorts worked upon Pear stocks. Of this I will give one instance, out of a hundred—the Pear Roakey, grown this season upon a pear stock, was uncatable, whilst grown upon a Quince it was really very good, and would have been pronounced by most people to be a different kind. The following might be found in some instances to follow the same rule.

Dr. Meniere.

This, which is just now ripe, is a fine, large, handsome sort, with delicious melting, sugary flesh, and a delicately perfumed flavor. It is quite new, and was raised by M. Leroy, of Angers, in 1864. I had trees of it from him in '870. It is a good bearer, and the tree grows freely upon the Quince.

Doyenne du Comice (alias Beurre Robert)

Although not properly speaking an early autumn sort, as it generally comes in in November, I have given it here on account of its intrinsic value as one of our very finest sorts. It is now so well known as not to require further description than to say that it is thoroughly melting, very juicy, sugary and exquisite. It grows strong upon the Quince and bears well.

Doyenne Robin.

A large and noble fruit, which, it will be well to say, is not like *Doyenne Robert*, which is a synonym of *D. du Comice*. I introduced it in 1860, but it had been in cultivation on the continent since 1850. It is melting, very juicy, sugary, vinous, with a refreshing and agreeable aroma. It grows and bears well upon the Quince, and is a very desirable sort.

Duvergnes.

This beautiful and fine pear was raised by Van Mons, about 1822, but it is not much known in this country. It is melting, with an abundant, rich, sugary, and vinous juice, and an exquisite flavor and aroma. The tree grows middling upon the Quince, and bears abundantly. It has many synonyms, as almost all the best pears have.

Eugene des Noches.

A nice, new pear, introduced by me in 1865. It is only second size, but with a delicious and delicate, perfumed, melting, and sugary flesh, and an abundant juice. The tree grows freely upon the Quince, and bears heavy crop.

Ferdinand de Lassopé.

A second-sized, delicious, new pear, with a fine-grained, very melting flesh, and an abundant, rich, sugary, acidulated, and exquisitely flavored juice. It was raised by M. Leroy, in 1864, and imported it in 1868. It is very worthy of cultivation. It ripens about the end of October, or the beginning of November.

Fondante de Charneu.

This large and fine autumn pear is supposed to be of Belgian origin, but by whom raised it is not, I believe, known. It is very melting, and sweet-scented, with a most abundant juice, very sugary, acidulated, with a savory perfume. It grows middling on the Quince, on which it bears heavy crops.

Fondante du Comice.

One of the finest and best of pears; it deserves to be in every garden where fine fruit is a desideratum. It has a very melting flesh, very abundant, very sugary, vinous, deliciously perfumed, and rich, aromatic juice, and being of large size, and the tree a good bearer, it recommends itself to every one's notice.

Fondante de la Roche.

A rich, delicious, melting sort, with very abundant sugary, acidulated, aromatic juice, and an agreeable, seckel flavor. I introduced it in 1865. Although here it is delicious and rich from a Quince stock, I would nevertheless not assert that, under other circumstances, it would prove equally fine.

Frederic de Wurtemberg.

This noble pear was raised by Van Mons, and named by him in honor of the then King of Wurtemberg. It is, without doubt, one of the finest pears we have; but there is great confusion regarding it. I have received three different sorts under the name, but soon found that two of them belonged to other sorts. The true fruit is very large, regular, pyriform, very handsome, and delicious. I need not here go more into its history; suffice it to say, that any one procuring the true sort will have added a gem to his collection. It ripens from the middle of September to the middle of November.

General Todleben.

Like the preceding, this is a noble and delicious fruit, about the same size and shape. The fruit, when peeled, is tinged with rose, and the flavor, &c., is all one can wish. It, however, produces two sizes of fruit; the small size is not equal to the larger, generally speaking. It keeps well after beginning to ripen; some of the fruits coming to maturity a month or six weeks later than those that become ripe first; and some of the fruits remain quite green in color, whilst others are finely tinted with light crimson. It has been confounded with the *Triumph de Jodoigne*, a very different sort, not nearly so good.

Gregoire Bordillon.

This is, as far as I know, the very largest, and very finest, very early pear. It ripened here, in 1870, in the beginning of August; this year, in September (1870 was a very warm season). It usually ripens in the end of August or beginning of September, before the *Williams* comes in. To this last it is a great rival in size, earliness, and quality. Under good circumstances, it will reach over 1 lb. in weight, and its exquisite flavor and perfume cannot be surpassed. It was raised by that king of pomologists—M. Andre Leroy, and should have borne his name, as I think it would perpetuate it for centuries to come. It fruited first in 1866, and I received trees of it from M. Leroy in 1869, which bore here in 1870 and 1871. It does well upon the Quince.

Jules Bivort.

This is, I think, the finest of all M. Gregoire's pears, raised by him at Jodoigne, Belgium; large, handsome, and excellent, with a fine-grained, very melting flesh, and an abundant, rich, sugary, and vinous juice, and exquisite aroma. The sort has several synonyms, which only attest its excellent qualities.

Madame Ellen.

This large and handsome sort was a posthumous seedling of Van Mons, and did not fruit till several years after his death; it is, without doubt, one of his best productions for beauty, fertility, and quality. The flesh is of a yellowish tint, fine and melting; juice excessively abundant, sparkling, and sugary, with a delicious, and savory aroma. The tree grows well upon the Quince, and the fruit ripened here in 1870, October 15; this season it will be a few days later. I had it in fruit in 1870, 1871, and 1873, and it has always been good.

Napoleon III.

A pear deserving the name of the great man it bears; it is quite new, and I obtained it in 1870. The flesh is very melting, and the juice excessive, following the knife as it is peeled, and the flavor is rich and savory, with a fine, vinous, and sugary taste. It first fruited with its raiser, M. Leroy, in 1864, and deserves to be generally cultivated as a fine and desirable early sort; here it ripened the last week in August.

Nouveau Poiteau.

Another of the seedlings of the indefatigable Van Mons, which fruited for the first time a few months after his death. It is large and handsome, the flesh successively fine and melting, with a rich and delicious juice, and fine and savory flavor. In October, 1870, I had it in fine condition, and considered it then, and do so now, a 1 in every way. It bears freely and abundantly upon the Quince.

Pierre Pepin.

A handsome, good, and quite new pear, introduced by me in 1870, from M. Leroy, who raised and named it in honor of his friend, M. P. Denis Pepin, once the superintendent of the hardy collections in the Garden of Plants, and by whose kindness I was able to enter that establishment as a student of botany, &c. The variety is worthy of the name it bears, being fine-grained and melting, with an abundant, sugary, and agreeable juice.—*The Garden.*

Hogs that run in an orchard picking up the wind-falls, and occasionally good apples, never have the hog cholera, which is another proof of the value of a fruit diet.

RIPENING PEARS.—E. M. Dady, Pa., speaking of Hoopes' plan of ripening pears, which has been extensively published, writes to the *Germantown Telegraph*—His plan is to ripen under blankets; I tried it thirty years ago, and it does not compare with laying them on sawdust and covering them with wall paper. He speaks of a cool room, but there is no cool room above the surface of the ground in warm weather, consequently the cellar is the proper place when you can have a dry one, as in my case. We ripen from two to five hundred baskets each year, and have done so for a number of years past with very little loss.

THE ARBORETUM.

Hardy Trees.

THE PIN OR SWAMP OAK (*QUERCUS FALCATA*).

This forms a dense-headed tree, 80 feet in height, with a stem 3 or 4 feet in diameter, and, when young, assumes pyramidal shape, but, when old, has far extending and drooping branches. It is very hardy, of rapid growth, and, when old, its secondary branches are numerous, smooth, slender, and so intermingled as to give them, when leafless, the appearance of being so many pins, a circumstance owing to which it is called the Pin Oak in the United States. The bark on the stems of old trees of this species is scarcely corked, and on young trees it is perfectly smooth. It is found in marshy places, over a large extent of North America, particularly in the States of Massachusetts, Ohio, Missouri, Georgia, Virginia, and Illinois, and was first introduced in 1800. The leaves are elliptic-oblong, rather than in texture, deeply and widely sinuated, more or less wedge-shaped at the base, set on long slender foot-stalks, deep-glowing green above, pale shining green beneath, and with the exception, when fully matured, of small tufts of tomentum in the axils of the principal veins on the under side, quite smooth on both surfaces, and, just before they fall off in the autumn, turn to a bright yellowish-red; the lobes are ovate-acute, somewhat alternate, with very deep open and rounded recesses, and a few very sharp-pointed serratures near the apex of each lobe terminated by bristly points; the veins are alternate, and not very prominent on the under-side of the leaf. The Aorns are round, solitary, or in pairs, and 10 lines long, and are contained in subsessile, flat, shallow, saucer-shaped cups, covered with closely-placed scales, and from 6 to 8 lines broad, and 2 or 3 lines deep. The length of a full-sized leaf is 7 inches, including the foot-stalk, which is about 1 inch long, and the breadth across the widest part is 4 inches.—*The Garden.*

Weeping Trees in the Fulham Nurseries.

Few places afford more scope for observation as regards useful trees and shrubs, than these nurseries, from the weeping trees in which the following notes have been prepared:—

Amygdalus Communis dulcis Pendula.

This is a weeping form of the common Sweet Almond, and is budded about 5 feet high on the Bitter Almond and Muscote and Mignonne stocks. It is of a decided pendulous character, and an exceedingly free-flowering tree.

Betula Alba Pendula.

This weeping Birch is one of the most graceful of trees. Its dimensions are those of a medium-sized tree, and it has long slender, perpendicular drooping branches. It is raised from seed.

Betula Laciniata Pendula.

This is commonly known as the Fern-leaved Birch; it has deeply cut leaves, and is one of the finest objects that can be introduced into English gardens. The young branches droop in cord-like festoons laden with pretty leaves, which in summer are remarkably attractive. The Fern-leaved Birches, indeed, are regarded by many as the finest foliage-trees in Battersea Park in June and July. Propagated by inarching or budding.

Cerasus Chamæcerasus.

This is a weeping Cherry; it flowers freely, and also produces fruit, which, however, is of no value. If grafted near the ground, it forms a thick and semi-trailing bush; but, if grafted standard high, it makes a fine close umbrella-headed tree, the branches being slender, very drooping, short, and thickly clothed with small leaves. It makes a fine pictorial object in shrubbery borders, and in other positions in which its head is seen above the surrounding shrubs. There is also a golden-variegated variety of this Cherry, which makes a beautiful and distinct object when treated like the green sort.

Crataegus Oxyacantha Pendula.

This is a weeping variety of the common Hawthorn budded on *C. Leeana* about 6 feet high. It grows vigorously, and produces a profusion of flowers precisely similar to those of common May. On lawns or in the front of shrubberies such trees as these are very effective.

Calophaca Wolgarica.

This is a pretty little shrub with pea-shaped yellow flowers, which are very attractive, as are also the red colored seed-pods. In its ordinary state it cannot be regarded as a weeper, but when grafted about four or five feet high on *Caragana Arborescens* it forms a

pleasing object. Its branches do not quite reach the ground, therefore "worked" plants are well adapted for fronts of shrubberies or for the decoration of rock work.

Fagus Sylvatica Pendula.

This is one of the most beautiful of weeping trees, when grafted close to the ground. Thus treated, the leader assumes an erect bearing like that of a Deodar, and grows rapidly, whilst the branches are thickly produced from the base upwards, and hang down in a most graceful and natural manner. Even when only three years old from the graft, trees of this variety have a fine appearance, and those grafted low are much better than others worked standard high.

Fraxinus Excelsior Pendula.

This is a weeping variety of the common Ash. It is grafted on the erect variety, either immediately above the ground or 6 or 8 feet high, more or less, as may be required. The branches hang down thickly and with a little attention will form almost an impenetrable veil, enclosing often a pleasant summer retreat. The ends of the branches, on reaching the ground, spread out or turn up, and may be shortened or encouraged as desired.

Fraxinus Excelsior Aurea Pendula.

This is a variety of the preceding, but scarcely quite so strong-growing, and it is characterized by the yellowish bark of the young branches which gives the tree a particular appearance.

Fraxinus Lentiscifolia Pendula.

This pendulous variety of the Lentiscus-leaved Ash forms a fine ornament in a sheltered situation. It requires to be grafted some six feet in height, in order to show off its true character to advantage, as its branches are very slender and willow-like compared with those of *F. Excelsior*. They are, however, produced in great abundance, this variety of Ash making an excellent pendulous umbrella-headed tree.

Ilex Aquifolium Pendula.

And its variegated-leaved variety—Most of us are acquainted with the Weeping Holly, although it is only a modern discovery. It has a truly pendulous character, is a robust grower, and makes a fine tree for an arbour when grafted about 6 feet high. There is also a beautiful variegated-leaved form of it, and both grow freely when grafted on seedlings of the common Holly.

Planera Richardi Pendula.

This is the weeping variety of the Zelkova tree; it produces long pendent, slender branches, which are pretty well clothed with leaves. It is grafted several feet above the ground, on the erect-growing variety. It forms a handsome ornament either for lawns, pleasure-grounds, or parks.

Populus Canescens Pendula.

This variety of the White Poplar forms a beautiful and graceful object, which, at a distance, resembles a Weeping Birch. It is grafted pretty high on the Lombardy Poplar, and prefers a rich and moderately moist soil to one dry and poor.

Populus Tremula Pendula.

This is a weeping variety of the Aspen, and a fine specimen of it may be seen in the Brompton Cemetery. It is a desirable and graceful tree for planting near water, but its roots must only be in a moderately moist medium, as continuous saturation would soon kill them.

Quercus Robur Pendula.

This is a truly pendulous variety of our common British Oak; it grows rapidly and forms a conspicuous object in the landscape grafted on the common Oak (*Q. Pedunculata*), on which it does well. It is by no means a common tree.

Salix Americana Pendula.

This is a strong-growing willow, and one often met with in gardens on account of its adaptability for many ornamental purposes, and its easy growth. It thrives best budded or grafted, and makes a fine object when worked low, as it annually sends up good growths, and in a few years forms a beautiful and graceful tree.

Salix Babylonica.

It need hardly be stated that this is the common Weeping Willow, with which everyone is familiar, and which is so well adapted for choice positions in gardens, cemeteries, or water margins. It is invariably grown from cuttings. There is an idea amongst horticulturists that the male variety of *S. Babylonica* is not in England, but in the Fulham Nurseries both male and female plants are growing side by side.

Salix Babylonica Annularis or *Crispa*:

This is generally known as the Ringlet-leaved Willow, and is one of the most picturesque objects to be found in our gardens. It thrives best near water, where it attains the dimensions of a small tree with drooping branches, not, however, like those of

ordinary Weeping Willows, but more after the style of those of a little Lime tree. There are some fine specimens of the Ringlet-leaved Willow in the arboretum at Syon House.

Salix Caprea Pendula.

This is commonly known as the Kilmarnock Weeping willow, and also called the weeping goat willow, and the great round-leaved willow. It thrives well in moderately dry garden soil, and has broad downy leaves and long branches. When grafted about 6 feet high, it makes a beautiful weeping tree, and as the branches are thickly produced, and the leaves large, they make a suitable canopy for an arbour. The shoots reach quite to the ground and sometimes spread out and run along it. The Kilmarnock willow is generally laden with catkins in spring.

Salix Fuscata.

This is an American Willow which has more of a creeping than erect-growing character; it has been lately tried, worked as a weeper, being grafted from 4 to 6 feet high. The effect has been excellent; thus circumstanced, it thrives admirably, grows strongly, weeps gracefully, and in spring is one of the most showy and free-flowering of willow.

Sophora Japonica Pendula.

This is one of the prettiest deciduous weeping trees which we possess; it is quite hardy and grows freely in any ordinary garden soil. It is usually budded on seedlings of the common *Sophora*, about 6 or 8 feet high, an elevation from which the branches hang down like those of an Ash, and on reaching the ground their points spread out or turn up. If grafted or budded close to the ground they send forth shoots like trailers; but, unless for banks and rockeries, this habit of growth is undesirable. There is a fine pair of old specimens of this tree in the Fulham Nurseries.

Taxus Baccata Dovastonii.

This is a peculiar broad or flat-headed variety of the English Yew, usually called the Dovaston Yew. It can hardly be called a weeping tree, as its branches spread out horizontally rather than droop. It is very ornamental and well adapted for planting on banks.

Tilia Alba Pendula.

This, which is the white-leaved European Weeping Lime or Linden, forms a beautiful object in the landscape, being an extremely strong grower, and producing an abundance of large and handsome leaves. It requires to be grafted pretty high, so as to give its branches space in which to develop themselves.

Ulmus Montana Pendula.

This is a pendulous form of the Scotch or Wych Elm, and it makes a beautiful spreading tree with fan-shaped and somewhat horizontally drooping branches. In the ordinary form, *i. e.*, when grafted at or below the ground level, this variety of Elm makes a fine object, being well furnished with branches from the base. When grafted standard high, too, it certainly looks handsome, and is well adapted for an arbour or gateway, but it cannot bear comparison, as regards beauty, with isolated specimens of the same tree grown in a more natural way.

Camperdown Weeping Elm.

This is a variety of *Ulmus Montana*, and thrives well on that stock. It has broader leaves than the common weeping kind, and is of a robust growth, whilst the young branches present at every joint a peculiar zig-zag form.

Ulmus Montana Glabra Pendula.

This is known as the Smooth-leaved Wych Elm; it forms a handsome object, and is quite distinct from all other Elms. The branches are long and droop almost perpendicularly.

Ulmus Montana Microphylla Pendula.

This is a small-leaved sort, the growth of which is rather short and weak; nevertheless it forms a good pendent umbrella-shaped tree. The stronger-growing sorts, however, are the most ornamental and useful.

Ulmus Montana Rugosa Pendula.

This makes a pretty ornamental tree used like the others. It is a moderate grower with somewhat wrinkled leaves, and light-grey colored wood.—*The Garden.*

A most beautiful and easily attained show of evergreens may be had by a simple plan, which has been found to answer remarkably well on a small scale. If geranium branches, taken from luxuriant and healthy trees just before winter set in, be cut as for slips and immersed in soap water, they will, after drooping for a few days, shed their leaves, put forth fresh ones, and continue in the finest vigor all winter. By placing a number of bottles thus filled in a flower basket, with moss to conceal the bottles, a show of everlasting green is easily insured for the whole season. They require no fresh water.—*Bulletin.*

THE FLOWER GARDEN.

Carnations.

There have been comparatively few additions made to the list of really desirable Carnations. Some varieties are very difficult of propagation, or perhaps we should say of perpetuation, for though they have been a long time in cultivation they are yet rare, owing to the apparent want of vitality in their constitutions. They die easy, so easy that one can never get a stock of them.

In our climate Carnations require to be carefully handled lest they perish in the winter. If the plants are allowed to become large they are sure to decay in the centre before spring. By cutting them down as soon as the flowering is past, and layering the several shoots, nice young plants can be grown which will come through the winter in perfect safety. On this account it is very desirable to obtain fine varieties of healthy habit, striking root freely.

There are two new and very handsome Carnations figured in the Floral Magazine for October which are said to possess the very desirable quality of vigor of constitution. They are very much alike in coloring, both being scarlet bizarres, and named respectively, *Mars* and *Guardman*. The strips are very regularly disposed, and the colors are bright and effective. Judging from the colored illustration they will stand among the most showy and desirable carnations grown.

Spiræa Japonica.

This is one of the most beautiful of all forcing plants for spring flowering, but it is something more than that; it blooms freely when planted out in a warm sandy border, and is extremely pretty. It is largely grown both in Holland and Belgium for forcing, and its roots are imported into this country about this time of the year in large quantities. It is only within these last few years that it has attracted attention; but even in that short period it is grown by the thousand by many of our London market growers and florists. In habit it is very compact, and in fresh greenness of color is unrivalled. Its flowers, which are multitudinous, are individually small, white, and borne on erect branched spikes. Out of doors it succeeds in any sandy border in the south of England. It also succeeds well in Ontario, and will be found a nice addition to ordinary herbaceous plants. When required for forcing, pot the root, which are in clumps, directly they are received, in sandy loam and leaf-mould; separately, if for small pots, but large specimens may be formed by placing two or three clumps together in a large pot. After they are potted, give them a thoroughly good watering, and then bury them beneath a bed of sand or coal ashes, where they may remain until they are placed in heat for forcing. By bringing them gradually into heat, a succession of this pretty plant may be enjoyed for two or three months early in the year. Its flower-spikes, being light and elegant in appearance, are useful for bouquets, or for dinner-table decorations. It is also known as *Holca*, and as *Astilbe japonica*.—*The Gardener*.

Care and Manure of Lawns.

We are aware that it is a long old-time practice to dress the lawn in autumn with coarse manure, and so make the whole fore-ground of a gentleman's place the apparent receptacle of his stable yard for the winter; but, thanks to our American ideas of propriety, and our knowledge of assimilation of plant food, we now measurably ignore the dogmas of old country gardeners, and use specifics, i. e., just now we apply salt at the rate of four bushels to eight bushels per acre, bone meal in same quantity, and plaster one-fourth. The sooner these manual agents, all except the plaster, are now applied, the better, unless it be upon a lay of land so sloping that the coming rains, with melting of snow and ice, will cause the commingling or detrition of the manures to wash away with falling water. In such locations we should not apply our specifics as above named until the snow and ice are gone, but then we would make no delay. The application of the plaster, i. e., its sowing, should be just after the grass has made an inch or more of growth.—F. R. ELLIOTT, in *Prairie Farmer*.

PRIDE OF MOUNT HOPE GERANIUM.—This is magnificent as a bedder. The clear, distinct colors, or variegated leaves, are the admiration of all who see them.

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The Canada Farmer.

TORONTO, CANADA, NOVEMBER 15, 1873.

Farmers' Convention at Chicago.

For some time past, as our readers are well aware, the farmers of the Great West have been in a state of considerable excitement over the wrongs inflicted upon them as a class, by railroad companies, middlemen, manufacturers, agents, and others. They have been made the victims of so many extortions, that farming has ceased to be a paying business, and stern necessity has roused them to effort in amelioration of their condition. The agitation reached its culminating point about the close of the past winter, and promised then to enlist in its behalf enough of public sympathy and political influence to secure adequate relief. Some state legislation was had with a view to restricting and equalizing freight tariffs, but this could do little toward redressing the evils complained of, since the price of grain is affected not by local charges, but by the rates levied for transportation along the great "through-routes" to the seaboard. During the busy season, the convention-fever subsided in a measure, and though discussions in the agricultural and other journals were kept up, and there was much friction among the farmers, middlemen, manufacturers, and agents, there was a manifest cooling-down of the excitement.

An effort was made to open another campaign of vigorous warfare, by means of a convention called for Oct. 22, in Chicago. The advertisements announcing it, invited delegates from all parts of the United States and British Provinces. The Convention was held according to notice, but, judging from the accounts of it in our exchanges, it does not appear to have been a highly successful affair. In the first place, the call was not very generally responded to. It resulted in bringing together a large number of representatives from Illinois, less than half-a-dozen from Iowa, a few more from Wisconsin, three from Indiana, and one each from Minnesota, Nebraska, and New York. Instead of the discussions taking as might have been expected, a national and comprehensive scope, they seem to have been pretty much confined to "State Legislation regulating railway freights and fares." The *Country Gentleman*, of Nov. 6, sums up the doings of this convention, and adds a

few comments, in the following paragraphs, which better than anything we can write, epitomizes the whole affair:—

"The result of the convention was a series of resolutions, of which we present a brief abstract below—the preamble reciting the statement that the result of land-grants to railways "is extortion and oppression," whereby men of great wealth revel in luxury, while those who earn the money are destitute of many of the comforts of life," therefore:

"1. Congress is requested to pass laws regulating the maximum freight and passenger rates between States; and Legislatures similar laws within States, and a protest is entered against the granting of farther public subsidies to private corporations of any kind.

"2. Congress is requested to open water routes of transportation from the Mississippi to the seaboard. [Voted down after a long and animated discussion, and a substitute passed, demanding the construction of railways and the improvement of water communications between the interior and seaboard, the same to be owned and operated by the general government.]

"3. The people are urged to create and sustain home manufactures.

"4. Approving a proposed freight railway from New York to Omaha—objected to and apparently lost.

"5. Urging everybody to keep out of debt—a resolution which we trust may have an excellent and wide-spread effect.

"6. Opposing the legislative protection of any industry, or special legislation of any kind.

"7. Recommending the local, county and State organization of farmers, to reform abuses.

A supplementary resolution authorized and instructed the president and secretary of the meeting to appoint a national committee of five, and State committees of three from each State, Province, and Territory, to urge upon Congress and State Legislatures the necessity of the railway legislation above demanded.

"To found a series of resolutions upon a statement of the inadequate returns of labor, in a country where labor of every kind receives remuneration far beyond that earned in any other country, and where one of the chief complaints of the farmer—who, as between himself and those he employs, is himself the capitalist—arises from the very fact of the high price he pays for the work he hires—is starting a sort of double-edged argument. We have also a strong resolution against special legislation of any kind, coupled with eager calls for legislation in favor—not of all those who "earn the money," but of that particular class who carry on farming, and who might not be as earnestly in favor, for example, of national and State laws regulating (in the way of a large increase) the wages they pay their workmen, on the ground that they are "destitute of many of the comforts of life." The *Prairie Farmer* objects to the resolutions as together "constituting a mixture of 'paternalism' and 'free trade' that will render them unpalatable to both the political parties of the nation." And we do not see that the movement has yet brought to the surface anyone capable of expressing the legitimate wants and reasonable grievances of the western farmers in a manner consistent with itself, or with any generally received theory of government. At the same time there is much that is reasonable and true brought forward at these meetings, and the ultimate result we trust will be for the general good."

There can be no doubt that the farmers of the Great West are suffering under a variety of disadvantages, inconveniences, and difficulties, but some of them, and not the least serious, are of a nature which Conventions and Legislatures are powerless to remove. Resolutions and statutory enactments can have no effect on such stubborn facts as distance from market, and exhaustion of a once fertile soil. So long as the Western farmer had the rich prairies to draw on, like a prosperous bank, and super-abundant crops rewarded the most superficial kind of tillage, he did not feel the pressure of high tariffs and low prices; but now that even the vast resources of that magnificent soil have begun to fail, and it requires manure and culture to secure a fair harvest, the scene is changed. The prairie farmer is on the same level with other husbandmen, when he is compelled to manure and work his land to get a return out of it. If he had begun right, and taken means to keep up the amazing fertility of the virgin soil, he might still be at an advantage in the magnitude of his crops, but you could not persuade him that the

prairie wealth was capable of exhaustion, or that the time would ever come when the merest surface-scratching would fail to secure bountiful harvests. But that time has come, and the extortion of railroads, middlemen, implement makers, and others, must bear a portion of the blame justly belonging to bad farming until the naked truth forces itself into view.

Five hundred to a thousand miles more of railroad, between him and the seaboard, puts the Western farmer at a great disadvantage as compared with a New Yorker or a Canadian. And so we find the agitation limited to the west, while even there the impression seems to be making itself felt, that after all, there are other sources of trouble beside those which it was at first proposed to remove by organizing societies and holding public meetings. It is our belief that the farmers of the west have rather a hard time before them. They have acquired slovenly and extravagant habits which it will not be easy to break; they have adopted a style of farming which would turn the garden of Eden into a barren desert; they have declared war against geography and longitude; they have mortgaged their farms for railroad and other speculations, and the evils under which they groan will have to be cured mainly by reform in economy, industry, and a better system of agriculture.

A Veteran Dairyman, and a Cheese-making Family

Mr. Harvey Farrington, of Norwich, Oxford County, Canada, and his children, are the managers of seventeen cheese factories and branches, at which is worked up the milk of 6,200 cows, that will turn out this year 2,220,000 pounds of cheese, all of it of superior quality. Mr. Farrington has had an unintermitted experience in cheese-making of forty-two years' duration, and is still in vigorous and active service. He has always occupied the front rank both as a judge and manufacturer of cheese, and his extraordinary skill has been faithfully transmitted to his children, all of them being first-class workmen in their line. It is doubtful whether there is another family in the world that can boast of an experience in the manufacture of cheese that is so large or successful.

Mr. Farrington is a native of Herkimer County, N. Y., where he is well remembered for the leading part he took in introducing improvements in dairy husbandry, and for his earnest and persistent zeal in pushing them forward. We have known Mr. Farrington all his long career, and to him we attribute more than to any other single individual the credit of bringing forward the first important improvements, and taking the first steps towards any real progress in cheese-making on this side of the Atlantic. He was the first to discover and explain the advantages resulting from the development of acidity in modifying the quality of cheese—a feature in cheese-making on which the superior quality of cheese for shipping depends. He was the first to note the effects of animal odor, and the influence of varying seasons on the quality of cheese, and among the very first to introduce the factory system into his native country, as he was also in introducing it into Canada. Having also been an active advocate of every prominent reform by whomsoever introduced, we know of no man living who can look back with a more just pride upon the extent and character of his influence in the cheese-making interest.

The Short-Horn "Mania."

Bell's Weekly Messenger, a British journal well-up in Short-horn matters, has an editorial under date of October 20th, commenting on recent sales in Australia, which appear to have been merely drafts from a well-bred miscellaneous herd, finds in them conclusive evidence of that world-wide appreciation of this particular breed of cattle, which we have more than once adverted to as having mainly to do with the general rise of prices. Six animals that sold for an average of £751 5s., are described as having been "a jumble of Booth, Bates, Butterfly, and a score of other good but various ingredients," and the sum they brought is represented as not having been locally considered "unprecedented or marvellous." Some account is given of their pedigrees as follows—

"The sire of all the six animals that sold for an average of 751l. 5s. each was a son of a Wetherly Duchess bull, from a dam by another Wetherly

Duchess bull, and his grandam, Lady Flora, was a very pretty little red and white cow, once the property of a Mr. Carr, in whose hands she bred the prize bull Windsor Augustus (10157), so well known when in the possession of Mr. Ambler, and afterwards as one of the sires used by Mr. Cruikshank, of Sittyton. Lady Flora was a great milk and butter cow, rich-fleshed when not in deep milk, a very early thriver, always making the most of a rather light frame. The result of her own and daughter's alliances with Bates bulls is to be seen in Duke of Brunswick (25937), whose stock have realized the price mentioned last week. They were all, as we are informed, from dams by Royal Butterfly 6th (18757), who had the two best possible crosses of Barrington Rose bulls, Master Butterfly and Royal Butterfly, upon the pedigree of Sir Charles Tempest's Venilia. Thus the animals have all a strong flavor of the "Veneley element." The whole matter is tersely summed up thus:—

"Taking the prices from time to time found recorded in Australian papers as realized at Australian private and public sales of Short-horns, and examining the strains of blood that command those prices, we discover evidence of two facts; first, that the so-called "mania" extends beyond the nations just now said to be specially under its influence; and secondly, that it can exist irrespective of the prevalent fashion which is understood to unite American and English lovers of Short-horns in a common bondage. In reviewing current criticism on livestock sales, a curious anomaly is perceptible. He who gives his thousands for a blood horse, that perhaps makes the purchaser's fortune a game of double or quits, is allowed the possession of unimpeachable equity, yet if the fancy or speculation should happen to make choice of a Short-horn, whose damage at the worst may be calculated with tolerable accuracy, the buyer is mad, stark mad."

Effects of the Labor Agitation in England.

The following item, from one of our British exchanges, indicates that the movement for bettering the circumstances of the agricultural population, is having the two-fold effect of raising wages and promoting emigration:—

On Thursday, Oct. 16, the great annual hiring fair at Newbury was held in the Market-place and adjoining thoroughfares, which were thronged with laboring people of both sexes during the entire day. Since he last fair, disaffection had been excited among the farm laborers in this and other districts by the proceedings of the National Agricultural Laborers' Union, and no serious disturbance or disagreement had occurred in Berkshire, and the agriculturists of that county were able to complete harvest operations without experiencing any difficulty from a shortness of hands, even although many men had migrated to the North, while a still larger number had taken free passages to the Colonies. Higher wages, were, however, asked at this fair, and employers who had come long distances to select men, quickly engaged the most respectable servants, and, as the fair was attended by nearly all the agriculturists in the surrounding district, young men and women whose characters were up to the average, found no difficulty in securing engagements. A party of laborers, with their wives and families, to the number of more than 100, have just left several villages near Newbury, and have proceeded, under the direction of one of the Union representatives, to the port of Liverpool, having obtained free passages to Canada, the committee of the Union contributing 50l. towards the expenses of transit, outfit, &c.

ONTARIO AGRICULTURAL COLLEGE.—We are still without the expected official details respecting this institution. It is understood that the Government are deferring their publication until preparations are sufficiently advanced to fix the date of the College opening.

AMERICAN SHORT-HORN HERD BOOK.—Mr. Lewis F. Allen, of Buffalo, announces by circular that he is now compiling Vol. XIII of the above-named work. It is therefore necessary that all breeders who desire their animals to have a place in it, should send on the pedigrees without delay. It is intended to issue the volume early in 1874. In view of the large and increasing trade in thorough-bred cattle between Canada and the United States, it is desirable that our best animals should be on record in the Herd Books of both countries, and that our stock-men should be well up in the Short-horn annals of both countries. Pedigrees with the fee for insertion, (one dollar each,) must be sent before the middle of December, to Lewis F. Allen, Editor American Short-horn Herd Book, Buffalo, N. Y.

Agricultural Intelligence.

The Farm Laborer in Canada.

The correspondent of the *Daily News*, who accompanied Mr. Arch on his tour through Canada, writing from Sherbrooke, P. Q., says: "The authorities of Quebec had deputed a gentleman well acquainted with the district to accompany us. On Friday, escorted by this gentleman and another Government official established here, we started to spy out the land. By Saturday night we had gone over some 80 or 100 miles. Our first stage was 40 miles by rail to a village named Stanstead, from whence we rode back to Sherbrooke. This drive took us through several villages and past numbers of farms. I am sorry to say our investigations were not satisfactory. If the farmers whom we met last week are a fair specimen of the Lower Canada farmers, I would earnestly dissuade the English laborers from leaving their present masters to come out and serve under them. Toil-worn, narrow-minded, and apparently without one other idea than that of how much work they can get out of a man for the dollars they must pay him, I know of no agriculturists in England whom I would not elect to serve under in preference to them. "What are your hours?" we said to one of the farmers who intimated his desire to have an English laborer sent out to him. "From sunrise to sunset during five months, and from six to six during the rest," was his reply. "Then all I can say to you," replied the outspoken Warwickshire man, "is that I wish you may get him." "But our pay," continued the farmer, "consider how good it is—a dollar and a quarter a day, with board and lodging." "Can't help it," responded Mr. Arch, "what you want is a slave, and Britons never will be slaves." The dried-up labor-starved owner of hundreds of broad acres seemed as much nonplussed as English employers have been by Mr. Arch's strong utterances. The truth is, these men have led such a hard, tough life, that they are not likely to be very considerate to others. Of course there are many exceptions, but this was the rule with these self-made men, as far as we saw them. On my expressing astonishment at the absence of laborers from the farms—for, driving all day through a farming district, I saw no men at work anywhere, except here and there one whom our guide assured us was either the farmer or his son—a farmer with whom we stayed to converse assured us that they got on very tolerably. "Yonder," said he, "is a farmer who is worth 6,000 dollars and a farm of 300 or 400 acres, and all his ordinary help is one young fellow whom you see now with him." And sure enough, as we drove past, there was the tough old fellow slaving away with his rake among the barley, and close at hand was the one farm hand. The comfortable, jolly-faced farmers of Old England need not grudge these Canadian farmers their rent-free domains. Verily there are worse things than rent audits. I have seen more haggard-faced farmers since I have been in Canada than I have met during a 40 years' residence in rural districts at home. And never have I seen during the same period such miserable looking, lank, and hopeless laborers as the few whom I have seen in the service of these terrible taskmasters. I am afraid this testimony will spread something like dismay among the Unionists who are looking to emigration for help from the pressure of their present circumstances. Let it be clearly understood that these strictures do not apply to Canada as the home of the English laborer. If, as I am sanguine will be the case, the Minister of Agriculture at the seat of Government should fall in with some suggestions which Mr. Arch will submit to him, a hope of a very bright and inspiring character may yet arise for the English laborer in this Western Colony. But, unless, as may possibly be the case, our investigations in Upper Canada should be more favorable than those which we have gone into in this lower province, Mr. Arch will certainly not recommend his clients to exchange their masters of the Old World for those of the New. One of the interesting features of this rising and most picturesque town is a large cloth manufactory, which Scottish enterprise has established. We dined today with the able head of the factory. He has some 500 hands at work, and the business is growing every year. I am struck with the fine openings presented on every hand for young farmers with a moderate capital. I am convinced that our English farming is the one thing needed to develop the resources of the country. The bad farming of the men now in possession is its greatest misfortune. One gentleman—I think, or at any rate I hope, an Englishman—has demonstrated in a most remarkable manner what may be done in the way of farming upon this fertile contin-

ent. We drove near his estate yesterday, and but for his absence from home we should have called and seen his farm. He has within the last six months sold ten head of cattle, reared by himself, for no less a sum than ten thousand guineas. One splendid animal has gone to England, purchased for the sum of three thousand guineas. We started yesterday on a 40 mile drive to a place called Scott's Town, where a few enterprising Scotchmen have formed a sort of colonization society. Some thousands of acres of land have been purchased, and already over a hundred hardy Highlanders and others are there hewing down timber and carving out fortunes. We found this an exceedingly interesting community, and the spirit of enterprise displays itself in a 60 horse power engine hard at work driving a saw through the timber as it is felled; and an excellent dam which is being built across the river. By-and-by water will have to do what steam is now doing, and the surrounding forests will be rapidly converted into lumber for house building and a thousand other purposes. The presiding genius of the colony is Mr. John Scott, a Glasgow man, I believe. He appears to be just the sort of man for his work, and has little doubt of having a thousand families catenched round his mills before five years are gone. I think he is not more sanguine than the appearance justifies. His scheme is very much like that which Mr. Arch will submit to the authorities at Ottawa next week, as the only one which will, in his judgment, meet the case of English farm laborers. Mr. Scott will build a cottage for each family, and grant an unincumbered plot of land. The timber on this land will be purchased of the men by Mr. Scott, so that the settler will not only be getting his land cleared for cultivation, but will be getting a supply of ready money wherewith to live in the meanwhile. The cottages are substantial erections, and appear very comfortable. All the folks seemed happy and hopeful. The more we see of the country—and I need scarcely say that these long drives into the very heart of it give us the best possible means of judging—the more are we impressed with its immense importance for civilization purposes. It would really seem as if half Europe might be gathered into its capacious bosom. There is plainly nothing requisite for man that may not be grown upon its rich and fertile soil. It appears to me that the one grand requisite for the development of its resources is a wholesale importation of Scotch or English agriculturists. Frenchmen make capital cooks—blessings on their skill! but of their forming I am sorry to say that to an Englishman's eyes it is bad as bad can be.

The Wheat Crop of the World.

SITUATE as the United Kingdom is with regard to the supply of bread-corn, with a growth of wheat which on an average even of years is not more than sufficient to feed two-thirds of the population, and with the deficiency annually increasing with the increasing numbers to be supplied, it is necessary at this time of the year to look round upon the neighboring countries from whence our supplies are usually obtained, and to ascertain to what extent they may be able to assist us in making up the deficiency in our own supplies. In some years—as the two last, for instance—although our resources from the produce of our own soil were largely and unusually insufficient for our consumption, we had no difficulty in obtaining what we required, and at a comparatively moderate price. There is, in fact, only one case in which we should feel any difficulty, and that is, when the deficiency is general, or at least in those countries from whence we get the bulk of our imports. How, then, is the wheat harvest of the nations around us has turned out in respect to yield is a question which we do well to look into in time. Our Government never interferes in such cases, leaving the question of demand and supply to the enterprise of the merchants, who are always equal to the occasion. How then, we say, do we stand in the present emergency? for such we are justified in calling it; and what certainty have we of obtaining the wheat we shall require between this and the next harvest?

The United States of America and the Russian provinces are the principal granaries from whence we derive a great part of our supplies of bread-corn. With regard to the "States," if the official accounts are to be depended on, their crops of wheat have proved very productive this year, so that they will be able to export largely both from the eastern and the western coasts. The aggregate crop is estimated at 25,557,000 qrs., of which they will be able to spare 8,911,000 qrs. It is probable that the quantities are rather exaggerated, but it is unquestionable that the crop is one of the best, both as to acreage and yield, that the United States have ever reaped, and

that there will be a large amount to export. The greatest obstacle in the way of getting the grain to the coast, either east or west, is the railway charges, which are so much advanced as to swallow up the whole of the farmer's profits. One account states that to get one bushel of wheat from Illinois or Iowa to the nearest port costs the value of three bushels.

The situation of Russia is quite the reverse of that of the United States. There is undoubtedly a great difference in that wide country, which contains all the varieties of climate and soil. But in those portions of the Russian territory most accessible to navigation, the wheat crop is all but a failure, and in some parts of the interior absolutely so. A Count Tolstoi, the author of "War and Peace," has been travelling in Russia and in the Government of Samara, from whence he wrote to the *Gazette de Moscou* a letter, in which he draws a distressing picture of the condition of that country, where nine-tenths of the population are actually in a state of starvation and destitution. His account is confirmed by a correspondent of the *Gazette Russe de l'Académie*. "In the district of Nicolaef," says the writer, "there is no crop at all. It contains 332,000 inhabitants, one-eighth of whom alone can survive without help from distant parts."

The few supplies that arrive at Odesa and Taganrog come by railway or by water; while the transports by horse power, as is usual, from the Russo-Polish provinces are wholly absent this season. At Taganrog they will not be able to execute the orders on hand; as the insufficiency of the means of transport to the port is also an obstacle. Odesa is equally destitute of a stock of wheat, the price of which is very high, and the large houses, who usually obtain their supplies from the Danubian Provinces, are not able this year to stock themselves. The accounts, in fact, from most parts of this vast country are increasingly alarming. The crop in general—with few exceptions—is bad; at certain points it is almost a complete failure, and thousands of the inhabitants are reduced to misery. The Russian press is fully occupied with this subject, and it is to be hoped that the Russian Government will do all in its power to alleviate the general distress. On the other hand, it is probable that, even if the export of bread-corn is not prohibited, the demand from the interior provinces of Russia will be so great that the supplies, if there are any, will be absorbed without the help of a foreign demand. "The crop is bad and insufficient," says the *Gazette of Moscow*, "in the Governments of the South, especially in Taurida, in the Governments of Kherson, where the crops have been burnt up by the drought; on the shores of the Dnieper, and Boug, and the Don. In these three districts the breeders of horses purpose migrating to the vicinity of the Black Sea, in consequence of the bad pasturage. In Southern Bessarabia the crop of wheat is bad, but good in the North. The crop is generally fair in central Russia, but has been destroyed at Astracan and Kamysch by Siberian Marmottes. In the South-west, in Titemis and Vohlynia, the crops are good; also in the governments of Saratof and Simbirsk. In the northern regions the severity of the winter and the abundance of rain have destroyed the cereal crops; but in Archangel the spring-wheats have turned out well. In Finland, also, and Esthonia the harvest has been good, as also at the other extremity of the empire—the Caucasus."

We give the above extracts from the Russian papers to show that we must not depend on Russia for any considerable portion of the surplus of foreign wheat this year. In 1872 we obtained from thence 4,162,816 quarters, which was more than one-third of the imports. During the first six months of the present year the imports from thence have increased to the extent of 1,432,147 quarters, as compared with the corresponding period of 1872, the high prices in Europe having stimulated the trade, both buyers and sellers, the former to lay in stock in anticipation of still higher prices, and the latter, fearing to trust to such a contingency, resolved to sell and clear out their stocks on hand, being satisfied with present quotations. Thus the relative importations into the United Kingdom of the two seasons of six months have been 3,758,013 qrs. of wheat and flour in 1872, and 5,370,160 quarters in 1873, the exports being in the same periods respectively, in 1872, 27,817 quarters, and in 1873, 64,067 quarters.

France, like Russia, will have a large deficiency to provide for this year, if the writers on this subject are to be depended on; at any rate, if she exports any, she will have to import an equal amount to make up the consumption. Last year her exports exceeded what she had to spare, and the exceptionally large crop she reaped was lavishly sold at the opening of the season at a comparatively low price, as she was compelled to replace this later at a considerable advance in price. This year, without any considerable stock

of wheat, and a mere fraction of her usual stock of flour in Paris and other depôts, the deficiency in the crops will, sooner or later, render a large importation necessary; and as the merchants have ceased to make any purchases abroad, it is probable they will repeat the error of last year, and have to buy dearer than they have been selling. At present they have been purchasing wheat on the English market, their own being very scantily supplied.

Belgium and Holland grow but little wheat; and this year their crops are very unsatisfactory, so that both countries will require larger importations than usual. In Germany, the results of the harvest are various. Round Hamburg and Schleswig-Holstein, Dantzic, and generally on the eastern parts, the crops of wheat are good in respect to yield, but they have sustained much damage from wet weather. The rye has suffered both in the winter and since. In Silesia and Saxony the oats and peas are the only crops that have failed. Hungary and the Danubian Provinces are largely deficient this season, and the Black Sea ports generally will have little to export compared with former years.

How, then, does England stand with regard to the supplies of foreign corn for the season? America will be the chief mart; but whatever country may have a surplus for export, there are so many countries which are deficient in bread-corn that the competition will be serious. England, France, Central and Western Germany, Italy, Switzerland, Belgium, Holland, Southern Russia, Hungary, will all have to import. Even Spain has a deficient crop, and the Spanish Government has imposed a duty of 5 per cent. upon the exportation of cereal produce, whilst the French Government propose to revive the tax on bread, although the people are already crying out about the price. With the certain prospect of a vigorous competition, we see nothing in the future to prevent prices from advancing. There is no reason to fear that England will be unable to obtain a sufficient supply for her own consumption. With an abundant capital at command and a free access to every country she can secure the trade of the whole world.

Australia and Chili must not be forgotten in reckoning the resources, and as Australia has reaped a good crop of wheat, she will be able to export a considerable amount to Europe. As to California, we are not aware whether its produce of wheat is included in the statistics of the United States; but at any rate the amount which California will be able to ship to Europe will be, it is thought, equal to what she sent last year. This wheat is getting more into favor, especially in France and other Continental States, chiefly on account of its great weight and excellent color. Its hardness is easily modified by a shower-bath, or in other words, a good sprinkling of clear and pure water, and then by drying on a boarded floor. This both mellows and loosens the cuticle, and increases the weight of flour. It is estimated that the United Kingdom will require an importation quite as large as that of last year, which was upwards of eleven million quarters.—*Mark Lane Express*, Oct. 20, 1873.

FABULOUS PRICES FOR SHEEP.—The high prices paid for certain breeds of sheep, a few years ago, when Atwood merinos brought anywhere from \$100 to \$20,000, are recalled by some great sales of breeding sheep that recently took place in Edinburgh and Kelso, Scotland. Black-faced and Cheviot sheep sold for about \$250 each, and Lord Polwarth disposed of some fancy Leicester at prices ranging from \$200 to \$500. His best ram brought \$1000.

A GOOD HEIFER—335 POUNDS OF BUTTER.—Mrs. N. Voseller, of North Buffalo, N. Y., reports to us a small red heifer that came in the 8th of November, 1872, being only 22 months old, and from the 15th of that month to the 15th of October, 1873, has made 335 pounds of butter, or a pound per day, average, and is making that now. Her milk was weighed several days in August, and found to be 23 pounds per day, and if we may suppose this heifer to average that amount through the year, she will have given 8,395 pounds of milk at the end of the year. She has been fed well, of course; cows don't give milk without feed.

SNAILS FOR MARKET.—In the district of Champagne, in France, the cultivation of snails for the Paris market has latterly become a profitable product, they bringing about 50 cents per hundred, and are in great demand as a delicacy. During the summer, after a heavy dew or rain, the peasants catch the snails as they crawl out, with house on back, for a promenade; contractors buy up the molluscs, inclose them in a kind of park, fatten them on salads, thyme, mint, parsley, &c. When large enough to pass through a ring of a certain size they are fit for the table—or are supposed to be.

Breeder and Grazier.

Ayrshire Cattle.

Dr. E. Lewis Sturtevant, of Massachusetts, recently delivered an address upon Ayrshire cows, before an American agricultural club. He remarked:—

Although this breed is usually written of as a mixed race, yet the larger portion of their ancestry must have been derived from the native cattle of the country at this time, and however affected afterwards by the introduction of improved animals from other places, yet must the Ayrshire cow be considered as the product of her environment. It will be in place, then, to refer briefly to the ancient cattle of the district. The first mention of the cattle of this region is by Ortelius, I think, who writes in 1573 that in Carrick are oxen of large size, whose flesh is tender, sweet and juicy. Aiton, writing in 1825, describes the older breed, from his recollection, as having been a puny, unshapely race, not superior to those yet to be met with in many of the higher districts. (Low's Animals, p. 342.) In the survey of Ayrshire, published in 1811, he describes them as being of a black color. That this breed had a certain uniformity we may infer from the invention of provincial terms to describe the location of the colors. Thus, a dark cow with a white face was termed a "bassened" cow; one with much white on her neck was termed a "hawked" cow; when a strip of white ran along the ridge of her back, she got the name of a "rigged" cow; and if the lower part of her tail was white, she was said to be "tagged." We can also infer the existence of animals sufficiently well defined to form a distinct variety, from the probabilities of the case, for Galloway in the south and the Highlands in the north, preserve a native race. The very misery of the country would also incline us to believe that there was a native breed, for it is only as we find intelligence directed toward the improvement of a breed that we find diversity of product. Wild animals have a certain uniformity because they are let alone, and soon become in harmony with nature. Domesticated animals vary because they are exposed to variable conditions, and although they become in harmony with their position, that position has not the uniformity of natural conditions.

Was the Breed Imported?

We thus find Aiton recording the importation, in 1750, of several cows and a bull of the Teeswater breed, of the high brown and white color so general in Ayrshire in 1810, and he gives a few instances of distribution from his stock. He also gives a hearsay account of some cows, which are conjectured to be of the Dutch, Teeswater, or Lincoln breed, being brought into the district by John Dunlop, of Dunlop; and also the introduction of some stranger cows, in 1769, by John Orr, of Barrowsfield, and thinks that there were probably other importations. As Aiton is willing to quote hearsay, and shews a great acquaintance with the county, it may be inferred that he, at least, had no further knowledge of even doubtful importance than he adduces. I will call attention to the fact that he records the introduction of but one bull—the rest were cows. We must give Aiton the justice of being a good observer, and of giving the credit of the formation of this breed of Ayrshire not to foreign blood alone, but to "selection, cross-coupling, feeding and treatment." A Mr. Home, in remarks before an agricultural club in England, in 1867, says that "others had introduced cows from the Channel Islands, from all which, combined Highland blood, the present improved breed of Ayrshires had arisen." This idea was probably derived from the unknown writer of the "Complete Grazer," of which the third edition was printed in 1808. It is there said (p. 7) "that the Dunlop breed is the produce of a cross of Alderney cows with Fifeshire bulls." The horns of this race are small and awkwardly set. The animals are small in size, and of a pied or sandy red color. They are, however, admirably well calculated for the dairy, on account of the richness and quantity of the milk afforded by the cows." Is not this probably another account of the Dunlop importation, where we have the Alderneys combined with the improvement rather than the "Dutch, Teeswater, or Lincolns," as stated by Aiton? For corroborative evidence we have it stated by Colonel de Contour, that Field-Marshal Conway, the Governor of Jersey and Lieut-General Andrew Gordon, who succeeded him; both sent, about the close of the

eighteenth century, some of the best cattle to England and Scotland. (Journal R. A. S., 1814, p. 47.) And Quayle, who wrote the "Agricultural Survey of Jersey," states that the Ayrshire was a cross between the Short-horned breed and the Alderney. (Quoted in Journal R. A. S., 1814, p. 47.) We thus see that there is great uncertainty about the early history of these crosses. In Fifeshire there is a tradition that 300 English cows were received there by James IV of Scotland, as a marriage dowry, with Margaret, the daughter of Henry VII. of England (1501.) This seems plausible, from this district being the country seat of royalty, and the customs of the times.

Ayrshires a distinct and Native Type.

Yet the introduction of this large number of cattle, if true, has not produced uniformity among the native cattle, for they are described by Low, in 1812, as having but little uniformity, yet are spoken of as being good milkers. Crossing, therefore, of itself, could have had but little influence in forming the Ayrshire breed in its earlier stages, for we have in our records but one statement of the introduction of a foreign bull and another of the crossing of stranger cows with stranger bulls—the Alderney and the Fifeshire. The introduction of improved beasts, as an index of an advance in public opinion, and the improving tendency of the time, is of importance, for it fixes rather definitely the commencement of the unproved breed. But in estimating the influence of a cross, remember that unless great skill is exercised, and care in procuring at frequent intervals fresh blood, the animals which are few in number are quickly absorbed in the preponderating race, and produce but little effect, except stimulating variability, and thus acting as an assistant in the art of selection. Where a foreign bull is used, in the tenth generation there will be but 1-1024 part of foreign blood in the offspring; and Gartner found that with plants one species could be made to absorb another in from three to five generations, and he believes this could always be effected in from six to seven generations. It was selection, aided probably by crossing, and environment, which formed and fixed the Ayrshire breed, and it is unphilosophical to credit the breed with having obtained its excellence from any other distinct race. After its distinctive types were recognized, we find records of crosses with other animals by way of experiment. The Kylvie or West- Highland cross brought in the woolly hair, upturned flatish horn, and hardy habits of the Swinley variety, highly valued at the show-yard, and differing in minor details from the prevalent race. The celebrated prize-taking bull "Geordie" is said to have one-eighth of the Highland cross. As to Short-horn crosses, we find diversity of statement. Archibald Sturrock, writing in 1866, says, that so far as he is aware, the only Short-horn bulls in Ayrshire, are the one at Balaagart, about eleven miles from Girvan, another at Woodlands, near Girvan, and a third lately brought into the country by J. N. Fleming, of Kilkerran House, Maybole. (Pr. Essays High. Soc. 1866-7, p. 37.) Mr Hope, of Fentonburns, a Short-horned advocate, by the way, says that half Ayrshire and half Short-horn is the cross generally preferred in the east of Scotland (not in Ayrshire notice), for milch cows. Prof. Norton, in a letter dated 1844, says, "every large farm that I visited had a full blood Short-horn bull" (Farmers' Library, Vol. 3, p. 306); but he states that these crosses were raised expressly for fattening. Mr Coleman, of Woburn, England, says that the first cross of Ayrshire with the Short horn improved its value as a grazing, and also as a dairy breed, but that the cross if again put to a pure blood Short-horn, was a worthless mongrel. In 1809, when my brother and myself spent several weeks visiting the farms of Ayrshire, we saw but one Short-horn bull, and found that the Alderney, whether cow or bull, was so far unknown, as to be an object of curiosity even in the mention.

Selection and Improvement.

In the short limits of an address I am unable to expand the early history as I should like, but I think I have shown that the Ayrshire cow is a creation of intelligence, and as such, is eminently adapted to the use of the dairyman. Her appearance was between 1750 and 1800, coeval with the improving of roads and the advancing of agriculture. The Earl of Eglinton commenced improvements about the year 1730. His agent, Mr. Fairly, introduced the Fairly rotation, and as the leases expired, this rotation, which required that but one-third of the land should yearly be under the plow, was carried upon all the farms. Up to the year 1785, wheat was seldom to be seen beyond the limits of a nobleman's farm. The improvement of the lands caused by improved culture, called for increased rents. As the poorer and more indolent farmers were driven out, the proprietors had

a choice of tenants, and while the most active and industrious were preferred, this very circumstance operated as an excitement to others to become more industrious, and every advance of rent called forth a greater stretch of invention, and served as a stimulus to industry. So Aiton wrote in 1811. Yet there is evidence of other causes at work fully as important and more direct in their action, which I shall have to pass over for lack of time. As the clay soil was in excess, and liable to be poached or worked under the almost continuous dripping of their moist climate, and as both climate and soil were suited to raising grass and herbage, great attention was paid to the dairy. The better milk was retained, while the poorer was rejected, and the sheep which experience showed to exist in the better cows, were sought for in the younger cattle, and introduced in the coupling, for the snowed Scotch farmer quickly learned that like produced like, at least in practice. Thus the Ayrshire was being built up. Thus she took on the shape of a complete dairy animal. From the circumstances of her surroundings she became eminently fitted by the general process of adaptation to uses, and selection, to fill her place in Ayrshire husbandry. A perfect fillet, her udder became developed in capacity and shape. No hostile udder here to fatigue and distress the cow in the pasture. Her hair became soft and woolly, a protection from the climate. Her fore quarter is light, her hind-quarters heavy, for the Scotchman had discovered that a cow milked by her mouth and through her throat, and sought digestive capacity. Each advance must have been gradual, and every step must have been fixed as it was gained. Her type is the type to be sought for by dairy farmers, and admirably so in America as well as in Scotland. If we take the points of six noted dairy breeds, the Ayrshire, as described by Mague; the Yorkshire, which is the milking unproved Short-horn, by Hutton; the Jersey, by Allen; the Suffolk, by Kirby; the Brittany, by Gangee; and the Ayrshire, by Aiton, we find that the preponderance of points mentioned, are as follows:—

Head, long	Thick, flat and thin.
Muzzle, fine.	1. best red.
Throat, clear	1. best roan.
Neck, slender	Body, large.
Shoulders, thin.	1. best small and short.
Chest, deep	Udder, large.
Breket, small.	" square.
Back, straight.	" well formed.

Here, also, we find the Ayrshire cow having a the marks of a dairy breed, and it we place any value on external shape as indicating internal function, we are bound to give the preference to this breed. So if any farmer, if he place any dependence on his judgment of form, if he lay any stress upon the shape of an animal, let such a farmer examine carefully into the merits of the Ayrshire before purchasing; for I hope to shew, before I get through, that such is clearly his duty.

The Ayrshire as a Milker.

I am not here to decry the Short-horn, for I believe in the noble, massy beast. I believe when grazing is the object, the Short-horn will claim the preference over any other breed. The promise of this breed, however, is to lay on fat, they are bred for this purpose, and the irresistible, unmeasured force of inheritance all tends towards this function. Why expect to raise good milkers here? Why seek indications of good milking families? Why seek the ancient records of Short-horn achievements at the pail, when evidence of fat was weaker than at present, on account of being nearer the source of the improved breed, to prove the value of the animal for milk? This is simply a question of fact to be decided by scale or measure at the present day. Short-horn milkers are found both among thorough-breeds and grades, but, so far as I have observed, the same uncertainty attends the production of good milkers among fashionable strains of Short-horns as among the mongrels, misnamed natives. It is the Short-horn cow which departs from the type of the improved Short-horn which is the best milker. When we hear the fact of a Short-horn of a fashionable strain giving much milk, it is so heralded as to shew that, in this case at least, an exception goes to prove the rule. The Ayrshire is bred, and has been bred for milk; her inheritance is all in the line of milk-producing. Her form indicates it; her records prove it. When aged and dry, the same functions which ordinarily fill the udder, fill her muscles with fat, but while milking, inheritance intensified yearly by selection, turns the energies of her system towards extracting materials from her food, and secreting the larger and richer part in the udder. As the Short-horn stands with the grazier, who has tried their quality, so does the Ayrshire stand with the Dairyman. By seeking improved breeds, the farmer is adding materially to the profits of his farm, for he is utilizing the great power and unerring certainty of inheritance.

Horse-keeping for Hard Work.

One of the most remarkable instances of how people run in one groove, generation after generation, is the universality of the use of oats and beans as food for horses. It is almost as much the effect of old habits and prejudices as the system of periodical physicking, which is so common; or, perhaps, the latter is almost a necessity of the former. In some parts of the north oatmeal is extensively used for pig feeding, and forms still, a staple food for many of our Scotch neighbors, but generally speaking, throughout the kingdom oats and beans suggest a horsey taste, whereas half a dozen other kinds of suitable food are never thought of for horse-keeping purposes. One of the most valuable, and generally one of the cheapest foods is Indian corn. Some years ago, when we had to do with horse-keeping, we used two bags of maize to one bag of beans with good results, and found nothing kept them in better condition for hard work and general health. We should mention that the corn was always spiced—2 lbs. of spice to each bag; but some of our friends will perhaps think it better unspiced. From the evidence of the manager of the London Omnibus Company, given before the Select Committee on Horses, we learn that the company feed their horses on crushed maize and chopped hay, and have done so for six years or more, using about 17 lbs. of corn and 11 lbs. or 12 lbs. of chaff per day for each horse. We prefer a mixture of maize and beans, as above, and think an equal weight of corn and chop—total, from 25 lbs. to 30 lbs. per day—will be generally enough. The preparation of the food, as well as the component parts, is a matter of importance, for the more easy it is made for the animals to properly dispose of it, the greater the economy of food; and thus a horse will do better on 10 lbs. of well crushed oats than he will on 11 or 12 lb. not crushed. The same applies to other corn, and it is desirable to have the hay (and straw, if used) cut fine, as well as the corn crushed. We think, also, a further advantage is gained by any process that softens the food, and restores, in some measure, the moisture taken from the hay in the necessary process of drying or making for preservation. This is a point on which many of our agricultural and horse-keeping friends will differ with us, but it does not follow that we are wrong. It involves labor and proper attention, but we shall be glad if any one will prove to us that horses would do better if half the water they take daily was absorbed into food, in soaking, steaming or softening the hard, dry substances, and preparing them for easy mastication and digestion, instead of being given from the pail. *Simpson's Cattle Breeder and Feeder.*

About Ponies.

Next to or before the brougham-horse in general utility, comes the pony, which is a sort of equine servant-of-all-work, the *souffre-douleur*—the whipping-block on which the boys and girls learn to ride, and the ready resources in any emergency, when the boy-page or groom has to hurry off with a letter or telegram, or to fetch some forgotten article for the cook. The late Sir Robert Peel did not ask a more difficult question when he invited the House of Commons to tell him "what is a pound?" than the man who, in a company of horsemen collected from the four points of the compass, inquires, "What is a pony?" In Yorkshire, Leicestershire and Northamptonshire, anything under 15 hands 2 inches is called a pony. The famous steeplechaser, the Lamb, which twice won the Liverpool Steeplechase, and stood 15 hands 2 inches high, was called "The Pony" by the professional reporters of his struggles and his triumphs. In Suffolk, which for some unexplained reason is great as a horse-breeding county, the height of a pony is settled at 13 hands 3 inches. In Nottinghamshire, the height is considered to be anything under 14 hands 2 inches; whilst in Devonshire and Somersetshire "the oldest inhabitants" consider any pony more than 12 hands high as the degenerate result of some foreign cross of the ancient Exmoor breed. Strictly speaking, a pony is one of a tribe reared for generations untold on mountains and moorlands, without shelter and without other food than the natural herbage. The true pony is bred because nothing of a greater size can be reared under the circumstances of soil and climate. The smallest size for any useful purpose is about 9 hands (i. e. 36 inches), well shaped ponies under that height are only fit for pets or for the establishment of a showman.—From Cassell's "Book of the Horse," by S. Sidney, for October.

Swine Breeding.

Prof. G. W. Jones, in the *Farmers' Home Journal* says: "For the health of swine, I have counted the following conditions essential:—

Abundant, nutritious, and varied food at regular intervals. Comfortable shelter from rains, hot suns and cold winds. Pure water and pure air. Access to fresh earth. Exercise and sunshine.

Which of these conditions is most important, I do not know, but I am sure that the failure in any one of them will work mischief. I have myself carefully attended to them all, and so far have no sickness, no sows to die in farrowing, no sows to eat their young, no broken down foot joints, no barrenness; but as I look about among my neighbors, I see frequent failures. One gentleman has recently lost forty-five out of forty-eight pigs, mostly at three to five weeks old. Upon examination, I found they were confined in small floored pens, with no access to the ground; other pigs near by which ran out, but received the same treatment otherwise, were doing well. I believe fresh earth would have helped them. Another gentleman has his pigs stunted; they are in small lots, with insufficient shelter, and are fed mainly on corn-meal. A large range, better shelter and greater variety of food would save them."

Buckwheat for Fattening Stock.

We often hear persons who consider themselves posted in the nature of crops and their relative importance in the domestic economy of the farm, speak disparagingly of buckwheat and many farmers from the old country who cling to the old world notions of things, prefer turnips or potatoes for fattening stock in preference to buckwheat. An extraordinary prejudice prevails among farmers who, one would suppose ought to know better, that if fed uncooked to sheep it will make them dizzy, that it will kill poultry, especially turkeys if fed to them in any quantity, and that the straw will give pigs such a cutaneous irritation as to cause sores behind their ears, &c. An experience in the use of this grain would serve to dispel all such fanciful notions, for it is admirably adapted to our climate, and one that answers the place to us, that corn does to the farmers of the United States. The meal of both grains can only be eaten hot as pan or griddle cakes, and who would not prefer a breakfast of smoking buckwheat cakes to one of Johnny cakes. While for fattening cattle or pigs, it is the equal of corn in every respect. We hear sometimes of 60 bushels of buckwheat to the acre, while 30 is an average crop. The preparation for it too is much more simple than for corn, and the harvesting of it likewise.

Mr. John Johnston, an extensive cattle feeder of New York State, says of it. "I have fattened many cattle, and far more sheep, on all or part buckwheat, for the last twenty years, and it will fatten stock as well for the amount of pounds as any other grain, oats, perhaps, excepted; and I would much rather have half buckwheat meal than all corn meal to feed to three years old steers that have not been fed grain."—*Col. Farmer.*

A Horse that Loved Sugar.

An English gentleman was visiting a farm-house, when a horse came to the door, grasped the handle of the door with his mouth, opened it, and entered the room. The mistress of the house, who knew what he wanted, put a lump of sugar in his mouth. The horse then backed out of the room, shut the door, and marched back to the barnyard. The woman said he often came in this way for a lump of sugar. This gentleness was the effect of kindness. Roughly treated a horse becomes ugly. Kindly handled and gently spoken to, it is willing, gentle and affectionate. Try it, boys, on your father's horses. Depend upon it, kindness is a magical wand. It will tame both brutes and men. Try it.—*Ex.*

Let every breeder of thorough-bred stock carefully select out of his stock what are worthy to be bred from, and the others, if they are males, castrate as soon as possible; and send the heifers to the butchers before they breed, and by pursuing this course we should see a greater improvement than ever before. Every man is not calculated to breed thorough-bred stock, but every man who breeds cattle should own or patronize a first class thorough-bred bull of some kind.—*H. C. Burleigh.*

"One who has tried it," writes as follows to the *American Farm Journal*:—"If any farmer wants a convenient and cheap cushion to ride on, let him take a sheep skin as soon as it is taken from the sheep, and scrape the flesh off, then lay it in a smooth place. Pulverize one pound of alum and the same of salt, and cover the flesh side of the skin and let it lie for a week or two, and it will be well tanned. They make the best seat for the reaper, raker, corn planter, or to throw on the horse to ride from the field to the barn, and if we should be caught in a sudden shower, they will answer for a protection."

A TIPPLING HORSE.—A sad case of depravity in horse-flesh is reported by the *Paris Figaro*. The favorite horse of a certain baron fell seriously ill, and though every care was taken of the animal it rapidly grew worse, and began to show signs of sinking. As a last resource, the coachman, an American, suggested that two glasses of brandy with ginger should be administered every morning. The cure was most speedy, but ever since the horse, having been accustomed to stand at the door of a wine-shop to receive its maternal beverage, now stops at every similar establishment it passes, and last week, angry at not being attended to, forced itself right through the window of a marchand de liquors!

BOVINE IMPOTENCE.—I have a thorough-bred Short-horn bull, 3 years old, in what might be termed good breeding condition, which has been fed on corn and hay principally in winter, and in summer on grass, but for the last twelve months has been rather slow in serving a cow, making frequent attempts before serving, and sometimes failing to do so at all. Can you give me the cause, and is there any remedy?—REMARKS.—This inefficiency is not uncommon, but we believe no treatment has been found effectual in restoring activity and vigor. A proper supply of nutritious food with plenty of exercise, may prevent an increase of the difficulty. Let the bull run out at grass through the summer; and he should also be let out in winter, whenever the weather is not stormy. This, we believe, is the approved practice in these cases.—*Chicago Live Stock Journal.*

Mr. Blenkinson, of England, the largest breeder of thorough-bred horses in the world, in reference to his method of feeding, writes as follows: A thorough-bred mare and her offspring require, during the year, the use and "cream" of at least, three acres of grass land, from which no hay should be made, but on which from what they would never eat on account of its becoming a little coarse a couple of polled Scotch heifers might be fattened. During the twelve months the mare would consume about a ton and a half of good hay, about 10 qrs. good oats, say a cwt. of bran, two cwt. carrots, about a gallon of linseed. The foal, presumably weaned the end of July, will take to end of year, seven qrs. best oats, 11 cwt. of first class hay one-fourth ton of carrots, 270 lbs. of split beans, one half cwt. linseed, five cwt. bran. I have not included straw in the above, but the quantity required would be between five and six loads for the two.

A SINGULAR OPERATION.—Some time ago I was requested to perform a singular operation, which I will relate simply to illustrate a peculiar piece of quackery against Sweeney. I had to cut two coins out of the flesh of a living horse. Both were healed in the connective tissue just beneath the skin; the one on the right shoulder, a few inches above and behind the shoulder-joint, and the other a little deeper, a few inches below and behind the shoulder-joint. The first one proved to be a Papal silver coin with the likeness of Pius Nono, and the other a simple American dime with the Goddess of Liberty. Both coins, according to the information given me by the owner of the horse, were inserted there by a quack for the purpose of curing Sweeney. Neither of these coins however,—neither that with the portrait of His Holiness, nor that with the image of the Goddess,—proved to be as infallible a remedy as the quack may have expected, for the horse was lame yet, notwithstanding that the coins had occupied their peculiar purse under the skin of the living animal for over two years.—*Veterinarian, in Chicago Tribune.*

Agricultural Chemistry.

Nature's Laboratory.

BY C. M. SMITH, M. B.

The chemical processes and operations carried on in the magnificent laboratory of Nature are vast in extent and unlimited in number. In the air surrounding us, and in the earth beneath us, during daylight and darkness, the elements are continually passing through a grand series of changes, consisting of separation of compounds into their simple constituents, and the subsequent combination of these again to form new bodies.

The primary agents in effecting these transformations are attraction, heat, light and electricity.

These acting as so many stimuli on that mysterious principle existing in the animal and vegetable kingdoms called life, bring into operation the varied and interesting processes of animal and vegetable chemistry. It is to the latter department that we shall devote our particular attention. As being that in which the agricultural chemist has the most interest.

We shall first briefly treat of the elements constituting the food of plants and their combinations, and in the second place of the changes which these undergo in their assimilation during the growth and maturing of the vegetable, and in its subsequent decomposition. Some of the constituents of plant food have already been briefly mentioned in the former articles on the chemistry of soils; it remains to investigate the composition and assimilation of various gases present in the atmosphere—the soil and water.

Water.

This fluid composed of two atoms of hydrogen gas and one of oxygen (H^2O) affords all the hydrogen present in organized bodies containing no nitrogen. But experiment has shewn that hydrogen in its gaseous state is unfavorable to vegetation. Now as analysis proves that it exists in plants, it follows that its combination with oxygen is the form in which it is assimilated by vegetable tissues.

Oxygen.

Saussure has proved by experiment that this gas is essential to the growth of vegetable structure as applied to the root, and further experiments have shown the necessity of its presence for the development of leaves, flowers and fruit. The same naturalist has shewn that the leaves of vegetating plants absorb oxygen during the night. These three gases in their combined state (water) are necessary for the germination of the seed, and also subsequently must be supplied to the cells and tubes of the growing plant in order that they may increase in number and size. It was formerly held by DuRoi and others, that water acted upon by vegetable vitality, constituted the sole food of plants, but later experiments have demonstrated that although a plant vegetating in water alone may increase its carbon, still, the whole of plant ingredients cannot be obtained from that fluid alone.

Atmospheric Air.

This contains in 100 volumes, about 79 of nitrogen and 21 of oxygen; it also contains a small portion of aqueous vapour and about 4 volumes of carbonic acid in 10,000.

Nitrogen.

Although this gas forms so large a proportion of the air, it does not in its simple state support germination nor vegetation. But nevertheless it exists in the wood in extract and in the green parts. It is probable, therefore, that it is in the form of ammonia* that this gas is assimilated by vegetables. Bousingault's experiments have shewn that plants derive their ni-

*Ammonia is composed of one atom of Nitrogen, and three of Hydrogen (NH^3), it is usually obtained by heating one part of sal-ammoniac and an excess of slaked lime in a flask, and collecting the evolved gas. It is very soluble in water, its solution being known as spirits of hartshorn.

trogen from the air; and hence we cannot increase the fertility of soil by a supply of nitrogenized products, or by salts of ammonia alone. The formation of vegetable products containing nitrogen depends on the presence of inorganic matters in the soil, without which the former cannot be assimilated. Where these matters are present, ammonia hastens the development of plants and thus enables them, by the increased amount of absorbing surface to store up a larger quantity of nitrogen than would otherwise be possible in the same length of time.

A ton of hay dried at common temperature is equal to 1720 lbs. dried at a heat of $257^{\circ} F$. the difference being caused by the loss of 14 per cent. of water. Now, according to Bousingault, hay dried at this temperature contains 15 per cent. of nitrogen, therefore in the ton of hay there are nearly 26 lbs. of nitrogen. This quantity will be furnished without the presence of manure containing carbon or nitrogen, so long as the necessary mineral ingredients of the soil are present.

Supposing that this nitrogen is taken up by the plants in the form of ammonia, as the atmosphere contains about $10\frac{1}{2}$ lbs. of the latter gas to every 1000 lbs. of carbonic acid, we find that the plant receives somewhat more than one part of ammonia for every 100 parts of carbonic acid absorbed by the leaves. The best analyses show that in different crops from the same surface of land, we obtain for every 1000 pounds of carbon the following quantities of nitrogen;—

	lbs.
From a Meadow	32.7
In Wheat	21.5
Oats	22.3
Rye	15.2
Potatoes	34.1
Beetroot	39.1
Clover	44
Peas	62

We observe from the above that the proportion of carbon to nitrogen stands in a fixed relation to the surface of the leaves.

A meadow which receives no nitrogenized manure will produce more nitrogen than a field of wheat which has been so manured.

A field of clover or peas which require no nitrogenized manure produces more nitrogen than a potato or turnip field abundantly manured.

Even after including the carbon and nitrogen in the stalks and leaves of beet-root and potatoes, it is still evident that cultivated fields, notwithstanding their supply of nitrogenized manure, produce no more carbon and nitrogen than an equal surface of meadow-land, supplied only with mineral elements.

From these facts Liebig has shown that the value of manures depends on the mineral ingredients restored to the land, not on the amount of nitrogen.

Carbonic Acid.

This gas composed of one atom of carbon (charcoal) and two of oxygen, is produced when carbon is burnt in an excess of air or oxygen, and also when hydrochloric acid or spirit of salt is poured on limestone. It is a heavy gas and sinks to the bottom of wells and mines forming *choke damp*. A lighted taper goes out when introduced into it, and its presence in excess in the air causes suffocation in animals. This gas, which is exhaled from the lungs of animals, forms an important food for plants during the existence of light, and is the source of carbon contained in them. It has been found that within a certain degree an increased amount of this gas in the air favors vegetation. Geologists have assumed that the air contained an excess of carbonic acid during the cool period of the earth's existence, thus contributing to the luxuriance of vegetation during that time.

On the other hand, during the night and in the shade, plants perform the same process as animals, that is, they absorb oxygen and exhale carbonic acid.

Although this gas is prejudicial to germination, Saussure has found that its application to the root is favorable to growth in the more advanced stage of

vegetation. Carbonic acid in the soil does not, according to Liebig, act as much as a source of carbon, as it does as a solvent for the earthy phosphate, and also a converter of neutral alkaline and earthy carbonates into soluble bicarbonates. The great object then in agriculture is to increase the power of assimilation possessed by the plant. This is accomplished as before stated, not by increasing the amount of carbonaceous manure, but by adding the deficient mineral constituents. The plant, through the agency of light, effects the decomposition of carbonic acid (CO^2) and with the elements of water (H^2O) forms starch ($C^6H^{10}O^5$). Lignine, or woody fibre, which often presents traces of the original starch cell has a similar composition, namely, $C^{12}H^{20}O^{10}$.

Saline Bodies.

Plants have been found to contain certain proportions of salts, such as phosphate of lime, sulphate of potash and soda, with chlorate of sodium. We can not doubt that these may be absorbed when held in solution by water. But it is not impossible that they may be formed in the plant from the simple elements derived from the air and soil. Saussure has proved that plants will absorb artificial solutions of salts by means of their roots. It has been held by some botanists that they do not constitute a portion of the plants' food, but are rather accidental in their occurrence. This idea has been suggested on account of the small quantity present in the soil and plants. But other instances occur in nature, which leave us no room to doubt that an ingredient, though in very small proportion, may be necessary to the composition of a compound. Such are the presence of carbonic acid in the atmosphere, and phosphate of lime in the bodies of animals. Moreover, there is another circumstance to be taken into account, namely, that the salts of mould as well as of vegetables are discovered chiefly in the ashes left after combustion, and that these ashes do not readily part with the salts in boiling water. Is it not possible that some of these substances found in minute quantities act in that peculiar mode called *catalysis*, in which a very small amount of a certain substance affects a change or decomposition of other compounds without undergoing any alteration in its own composition or its quantity.

Earths.

These include silica, alumina, lime and magnesia. They exist in plants in very small quantities, though forming a large portion of the soil which nourishes them. Schrader has found that when wheat, rye, barley and oats were grown in flowers of sulphur properly watered, the mature plant contained more earthy matter than had existed in the seed. Here then appeared to have been a formation of earths by the plant, unless we suppose the additional quantity to have been derived from the air. Saussure has also found that plants growing on a calcareous (limestone) soil, which yielded little or no silica in its analysis, afforded a considerable quantity of that earth, and Einhoff has found not less than 65 per cent. of lime in a fir growing on granite soil. The state in which earths are taken into the plants is most likely that of solution in water, for although they are but slightly soluble and usually require the presence of acids and alkalies, still as they are needed only in small amounts, the water supplied from the air and soil contains quite sufficient for the wants of the plant. But experiment has shown that the earths alone or even with the addition of water, are not sufficient to sustain a plant from the period of germination to that of maturity. In regard to the states in which these earths exist in the soil, it may be stated that silica, or silicic acid, exists nearly pure in quartz, or rock-crystal, flint and sand; chalcedony and agate are also forms of it. Its presence in the soil is chiefly in the condition of silicates of potash, alumina, lime and iron, originating from the disintegrating effects of air, water, &c., on granitic or primary rocks. Although in analyzing a soil, alumina is usually obtained as a phosphate; it does not follow that it exists as such in the soil, for the phosphoric acid may be combined with lime, while the alumina is uncombined. The lime exists in the different conditions of carbonate, phosphate and sulphate; the former combination being very abundant, composing the great limestone formation. The magnesia occurs as sulphate (Epsom salts) and carbonate. A form of limestone, containing magnesia, (dolomite) is sometimes met with in the Trenton rocks, belonging to the Lower Silurian formation, which prevails through Canada.

† The new nomenclature is adopted on account of its universal use at present.

(To be continued.)

Poultry Ward.

The Dragoon Pigeon.

There is perhaps no variety of pigeons respecting which there has been more dispute than the race known as Dragoons; the variety which it most closely resembles is unquestionably the carrier, and old writers state that it was produced by mating a tumbler with a horseman or a carrier. The accompanying engraving is a portrait of a Blue Dragoon hen.

There are in the Dragoons five acknowledged colors—blue, silver, red, yellow and white. The first and last named are the most numerous classes. The great difficulty to the uninitiated is in distinguishing them from their allies, the carriers, whose name must inevitably crop out when describing Dragoons, but between the matured birds of each there is a marked difference. Notwithstanding this the young carrier is often placed in competition with the Dragoon. We well remember, some years since at one of our poultry shows, an ardent fancier placing a Dragoon in competition with young carrier cocks. Col. Hassard who acted as one of the pigeon judges on the occasion, at once detected the wrong, and pointed it out to the fancier who acknowledged it, but naively replied, "he didn't think any of the judges would have been competent to detect the difference."

Dragoons should not be large birds, but of moderate size, neat and compact in form, light in feather; have sharp pointed wings; be broad in shoulder, with butts well displayed, and narrow rump; the head should be long and straight; skull narrow, well developed at the back. The eye should be large and prominent, the lash, cere or flesh wattle, uniform, equal, white, and circular, with but little of it. The wart upon the beak should be small and not over-hanging. The neck should be long slender, and graceful; the carriage erect; the legs long, clean and angular; the feet large. The general bearing of these birds is of a timid tremulous kind invariably displaying a shaking and nervous temperament. These are the essential points of show Dragoons. Taking the different colors separately, they may be described thus:—

Blue Dragoons

Should be of a good sound color upon the sides of the wings, head, belly, thighs, back and tail.—The head is generally of a rather dark blue, the neck also dark, and gorgeously illuminated hue bright iridescent colors, and terminating in a distinct and circular line upon the shoulders, breast and back, thereby producing a pleasing contrast with the lighter and less brilliant parts of the body; the lower extremity of the wing coverts have two narrow and jet black bars, running obliquely, and terminating just above the thigh; the tail, also, has a band of black about an inch wide, and within a quarter of an inch of its end; the flight feathers are dark. The beak must also be dark; the eye of a bright red color; the legs and feet red, and with dark nails.

Silvers

Are frequently bred from and crossed with blues, but it is better not to do so, for as a consequence, too often the produce of such a mixture is a muddle of both, resulting chiefly in the production of birds of a silver color, with black bars and dark flights, which are, therefore, not regarded as Silvers,

but are looked upon as washed out blues. True Silvers may be simply described as follows:—The color is of a sort of whity-brown, or very light drab, with darker drab bars, neck and flights; they should have light horny bills and nails; the hackle is not so beautifully resplendent as in the Blues, the iridescence being greatly diminished by the drab tint of which their color consists. The eyes of this variety partake of a rich pearl kind, without a particle of yellow observable in them. They are a very attractive variety, and good specimens are very scarce, especially cock birds.

Yellows

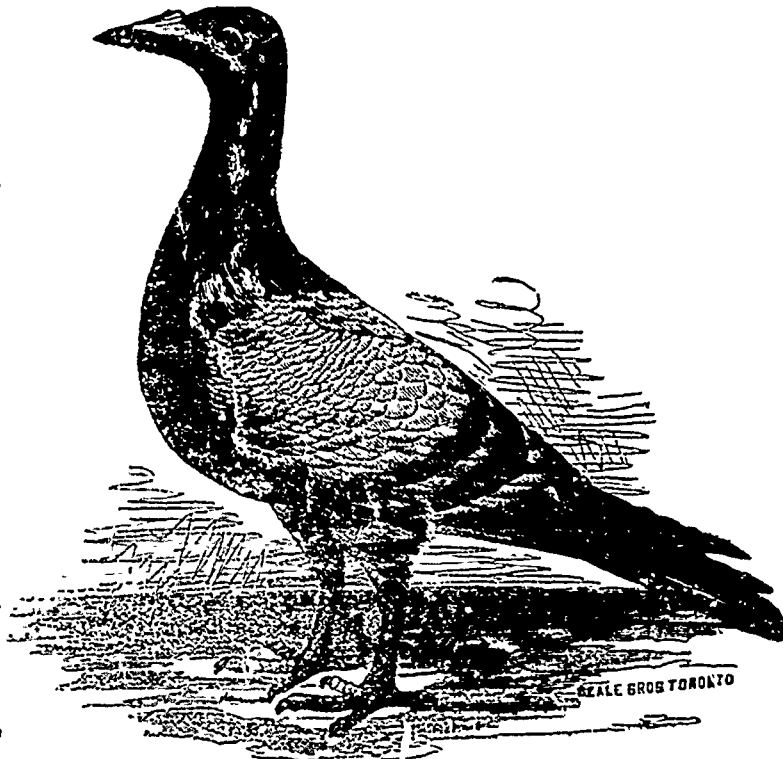
Are rather a scarce variety, as they are difficult to breed pure in color, and good in shape as well; for with close breeding they are sure to degenerate, or if fresh blood is infused they will as surely show the white feather, or the slaty-rump or thigh; therefore, they are by no means numerous. Good yellows should be of an entirely uniform color, and not yellow as their names signify, but of a rich sienna brown; the eye should be of a bright red color; the beak flesh colored (pinkish white). In other respects they should answer the general description

Any color upon them, with the exception of their legs, amounts to a disqualification.

Many fanciers have a great admiration for this breed of birds on account of their symmetry, the grace of their carriage, and the rapidity and vigor of their flight. The blue birds, if well marked, have, generally, a preference over those of other colors, either red, yellow, silver, or white. The wonderful game-cock-like symmetry and hardness of feather that distinguish the best blues, is rarely, if ever, seen in Dragoons of other colors. The yellows and reds are generally very broad-headed; and whites and blacks are too often merely coarse-wattled half-bred Carriers. With regard to management, Dragoons require no special care, they are such admirable parents that the commoner specimens are constantly employed in rearing the young of other varieties. Formerly, pure bred Dragoons were largely used for conveying messages, but other breeds were also employed for that purpose. The name of "Skinnum" is sometimes given to the mongrels bred between a Dragoon and any common pigeon. Many of these birds are strong rapid flyers.

Silver Grey Dorkings.

This beautiful variety of the Dorking has, of late years, come into high estimation in England, and at all respectable poultry shows are given a separate class. In size they are not equal to the colored birds, but possess many of their good qualities, while in beauty of plumage they are regarded as ornamental poultry. By the judicious selection of lighter colored hens of the colored variety, this breed was finally established and now produce true to color; indeed, the difference between the Colored and Silver Grey may be set down as in the one case breeding for the darkest, the other the lightest shades of color. In both cases the form of the body should be identically the same, as should also be the comb, wattles, feet, &c. Greater care is perhaps required in the mating of Silver Greys than perhaps any of the other varieties. It must be borne in mind, that in all sub-varieties, purity of blood is only established by breeding one degree from the ancestral stock, hence the danger of always "throwing back" to the distinguish-



ing points of the original type. Of this we have numerous instances, none perhaps more notable than the Sebright bantam, which requires the greatest care in the selection of breeding stock, in order to breed true to feather and markings. In no instance should the careful breeder of Silver Greys mate his birds with other than stock which has long been bred with care; no matter how correct to appearance, the birds may be, disappointment in most of such cases is sure to follow; for, although the maxim that like produces like may prove true, in many instances it will be the reverse. The distinguishing colors of the cock should be a perfectly black breast, tail, and larger tail coverts; the head, neck, hackle, back, saddle, and wingbow as clear a silvery white as possible, while across the wings there should be the well marked black bar, affording a very striking contrast with the white outer web of the quill feathers and the silvery white-hackle and saddle. This bird, mated with a hen, the breast a salmon red, passing into grey towards the thighs; the neck silvery white, striped with black; the back and sides silvery grey, each feather showing the white shaft distinctly; the wings of a silvery grey, free from any tendency to redness; the shades of grey on the body and sides,

Reds,

Like the yellows, are scarce, and still more difficult to obtain of a good rich color. They are generally tinged with blue upon the rump, belly, and thighs; the beak should be darkish, the eyes bright red. There are some, although few, excellent specimens of this kind, which are very beautiful, and ought to be prized, the neck being beautifully enlivened, with a rich copper bronze, which adds greatly to its appearance.

Whites

Are very beautiful. They should be pure white; have dark eyes with white lash; with white beak and nails. Indeed they should be quite colorless,

becoming slightly darker as it approaches the tail, which latter is dark grey, the inner feathers almost black, should secure a meritorious progeny. But even with the greatest care, many of the cockerels will have grizzled breasts, and pullets red wings, or or even sandy colored all over.

In respect of size Silver Greys cannot compare with the gigantic colored birds, but is equally hardy, and by epicures considered more juicy and tender in flesh. To overcome the difficulty in size, a little judicious crossing would be of benefit. A large cockerel of the silver greys, if mated to the lightest of the colored Dorking hens, would produce chickens the larger portion of which would present, more or less, of the silver grey character. Crossing these back again would doubtless increase materially the size as well as vigor and constitution.

Cuckoo Dorkings.

It is held by good authority that the origin of this variety of the Dorking was produced by crossing the white with the colored breeds. In size it is about midway between the white and colored, is very hardy, a fair layer, and well adapted for general farm purposes. The marking consists of bars or pencillings of dark blue grey over a ground of lighter grey, exactly similar to the Dominiques. Considerable variety of shade may be mentioned as the ground color, ranging from almost white to bluish grey, and the bars or pencilling from bluish grey to nearly black. In England various attempts have, in recent years, been made to encourage the production of this breed, but apparently with little success. Fanciers do not seem to take kindly to it, and, although, at some of the leading shows there, special classes were provided for it, the result was not satisfactory. The chief difficulty in breeding Cuckoo Dorkings is the prevention of reddish or golden feathers in the hackle, or saddle of the cock, and white in the tail, which are considered disqualifications. The cuckoo color should be pure all over, and birds thus bred are not devoid of attraction in the show pen.

White and Black Cochins.

Your issue of September 15th arrived to-day, and the allusion to me in your article on White Cochins has given my mind a start backwards, and brought to remembrance my Cochin breeding of former days, a bad thing for me, for cochin-like when I do crow it is generally too long and loud; but as you have not had a line from me for some time, I may on this occasion be allowed a little extra space. The fact is, as your articles show, you are beginning to know too much for us, and instead of giving information to fanciers on your side of the Atlantic, we shall have to take a lesson ourselves, nothing being left us to teach.

In the case of White Cochins, those now exhibited in England by Mr. Woodgate and others, are quite equal to the best birds shown, and often beat them. Vanity here prompts me to say that his original stock came from mine, sold on my departure for Canada in 1863. Of course they have been improved to keep pace with the fashion of the day, but it certainly did afford me much pleasure when Mr. Woodgate wrote and told me of the fact. They are grand birds certainly, these White Cochins, but I admit do show too much yellow now and then if carelessly mated, but do not all white birds do the same? Expose them to the sun, and a Canadian sun too, and they tan as all fair ladies would. The whitest bird for his age I ever saw was the bird alluded to in your article, but there were no vulture hocks, in fact the trio were simply perfection when they left me; I should like to see their like again in my yard, but up to the present I never have. I imagine the voyage did not leave them as well at the end as they were at the starting, and I was almost deterred from ever sending any more across, not wishing to wreck my fair fame on the Atlantic. Mr. Zurhast, however, was the

breeder, and he deserves all the credit of producing such fine birds.

A vulture-hock must be a stiff (wing) feather growing out of the thigh. It grows straight and does not curl round the shank. In some Black Cochin specimens, I have seen these feathers grow down the thigh, widening it to the view and producing a pretty effect, but there are long feathers, soft of texture, not stiff, projecting from the leg or thigh, which, from their softness, soon accommodate themselves to the form of the thigh. I think you always find birds with these good in feather all over, and many of you now, from practice and experience, do not require their grandfather to teach them to suck eggs.

I have lately taken up Black Cochins, I found washing the White so much trouble. Are you doing anything in that line in Canada? There is one hint I can safely give, don't be afraid of putting a sound Black cock with a White hen, you will get the color from the male, and form from the female. I have not one White among forty birds bred this way. The chicks when first hatched came like Black Spanish showing white, but it all disappeared and left a raven-black. I shall not repeat it in the second cross, but I don't I should mind trying it again in the third, to obtain the real Cochin form, which few Blacks have in these days as yet. In former years I have seen Black hens perfect, and from the above cross I have now the raven plumage in both the male and female, and besides useful birds for stock. Yet they are not such birds as I hope to have if I am spared a few years more. I think if you have Black Cochins in Canada, it would be well if Canadian breeders would give them greater attention. Your winters oblige you to house birds; and keep them as you will, Buff and White will show dirt, especially if a piece of charcoal is left in the ashes they have to bask in.

A Black Cochin is a grand and handsome bird, with lustrous plumage like a Black Hamburg. The legs should be, I conceive, as near yellow as can be got, but they will be more or less darker than their Buff and White brethren. The lay equally as well, if not better than the Whites, and White I have always found in England and Canada lay larger and a greater number of eggs than any other Cochins. I am at the end of the page, and my crow must end like a Cochin when his beak arrives at his toes.

F. C. HASSARD

SHEERNESS, England, Oct. 1st, 1873.

Hints to Poultry Exhibitors.

(Continued from Page 329.)

Of the many varieties of game fowl, a few only are usually named in prize lists. In the Provincial, which we are now considering, three separate classes are mentioned, viz.: Black, Blue or Brown, Duckwing, and Pile (White or Blue).

In the Black Red cock, the head and hackle should be bright orange red; back, shoulder-coverts and wing-bow, rich violet red, shaded with orange; wing coverts, rich green black, forming a bar across the wing. Secondaries, rich bay on outer web, which is all that appears when the wing is closed; black on inner web with a black red to each feather, forming a black edge to corner of the wing; primaries, black, with a bay edge on outside web; saddle, bright orange red; breast and under parts, rich deep black, of a bluish shade; tail black, glossed with green or purple. In the hen, the hackle should be rich golden yellow, striped with black, breast, a salmon red at throat, running into ash color towards the thighs, which are a brownish ash color; rest of the color, a rich brown partridge marking, which should on no account run into distinct stripes or pencilling, except on the larger tail feathers, in which some approach to bars is generally perceptible. In both sexes, the beak should be yellow or horn color. Whole face, includ-

ing comb and deaf ear, brilliant scarlet red. Eyes, brilliant red. Shanks, willow or orange preferable, but yellow or white permissible.

In the Brown Red cock, the head and hackle should be orange red, with a faint trace of streak in the feathers; back and shoulders, dark crimson; saddle feathers rather lighter than the hackle, shading off at sides into dark lemon, with a rich stripe in each feather; wing coverts, glossy black; primaries and secondaries, a darker color; breast feathers almost black, laced with bay, with a little streak in the centre of each feather; tail black, the sickles richly glossed; thighs and all under parts, black. In the hen, the hackle should be rich deep gold, rich gold, a bright lemon, striped with black; rest of body, brilliant black, dusky black, a very deep brown, all being admissible; but the brilliant black-bodied hens should go with the lace breasted and brightest colored cocks to look well. In both sexes, beak nearly or quite black; face and head, a deep rich purple red; eyes, a very dark brown or black; legs, dark or willow.

Duckwing.

The color of the hackle of the yellow Duckwing cock should be a light straw yellow or yellowish white; back, shoulder coverts and wing bow, a bright brassy maroon; wing coverts, a bright steel blue, forming a bar across the wing as usual; secondaries, white on under web, and black on inner web, with a black end, appearing white, with a black upper edge at corner, when wings closed, primaries, black, with a white edging on outer web, back a maroon, straw or claret; the saddle shading off to straw, a shade darker than the hackle; shoulder butts, breast, and under parts, a deep black; tail, black: the sickles richly glossed. In the color of the hens, the head should be grey; hackle silvery grey, striped with black; breast, a bright salmon red, verging to fawn color, shading off on lower parts to ashy grey; back wings and saddle, a silver grey covered with distinct bars or pencilling, and showing shaft of feather white, to be quite free from any red or brown tinge; tail, a darker grey, almost black. In both sexes, the head, face, &c., brilliant scarlet red; eyes, bright red, legs, willow or yellow, willow preferable. In the Silver Duckwing Game cock, the head and hackle should be silvery white, free from straw shade or dark streak; back, shoulder coverts and wing bow, silvery white; shoulder butts, a bluish black; wing coverts or bars, a brilliant blue; and secondaries a pure white on outer web; black on inner web—a spot of blue-black on end of each feather, giving a bluish upper edge to the lower corner when wing is closed; saddle feathers, silvery white as the hackle; breast, a deep blue-black; and all under parts black; tail black, with all the sickles very brilliantly glossed. In the hen, the color of the hackle should be silver, heavily striped with black; breast, a smoky black, very faintly edged with dull grey or white, the shaft of the feather showing slightly, giving the whole a very dark smoky-grey appearance; tail, dark grey and black, with a strong smoky tinge. In both sexes, face and comb as in the Yellow Duckwing; legs, dark willow or black.

Pile.

In the Pile Game cock, the color of the hackle should be orange red, or chesnut red, free from white or mealiness; back, a deep chesnut red; shoulder coverts and wing bow, chesnut red or violet red, wing coverts or bar, white, the feathers edged with chesnut; secondaries, chesnut or bay on outside of lower web, and white on the inner web, appearing bay when wing is closed, with a white spot on the end of each feather; breast, white, the upper part faintly laced with chesnut; all under parts white; tail white, as free from black marking as possible. In the Hen, the color of the hackle, light chesnut, with a little white in centre of feathers, breast, chesnut in upper part, shading to nearly

white on thighs; rest of the body white, more or less marked or laced with chestnut, some latitude being allowed; tail, white. In both sexes, face, &c., brilliant scarlet red; legs yellow, willow or white; eyes bright red.

In all game birds, the defects are bad head, too much hackle, tail too long or spread, legs not in proportion, imperfect feet, eyes wrong color, want of symmetry, condition or hardness; and the disqualifications are crooked backs, crooked breasts, duck feet, or any other evident weakness or deformity; color of legs not matching in the pen, any other than single combs. Adult Cocks undubbed; any fraudulent getting up for exhibition.

Bantams.

To game Bantams, prizes are offered for two varieties: Black Red and Duckwing. In these classes the same remarks apply as in the corresponding classes of game fowls. Smallness of size must, however, not be lost sight of by the exhibitor. Sebrights are offered a prize. In Golden Sebrights, the color of the head, face and wattles should be rich red; deaf ear, white; plumage, rich golden yellow; every feather laced with rich black, that is, having a narrow, even, well defined, rich black edge all round the feathers, the two colors distinct, and not shading into each other; the lacing of the same width on the sides as on the ends of the feathers; legs, slaty blue. Silver Sebrights should be similar to the Golden, only substituting silvery white for the golden yellow ground color.

In the "any variety class" may be shown any fowl to which no special prize is allotted. We will mention a few of the most important, and to which separate classes ought to have been given:

Leghorns.—General Characteristics of the Cock.

Head and Neck.—General appearance of head resembling Spanish; beak rather long and stout, but not heavy; comb very large, single, perfectly straight and upright, of a handsome outside arch or curve, with serrations, symmetrically formed and disposed, and free from excrescences; wattles long, thin and fine in texture; face fine in texture, and nearly free from feathers; deaf ears well developed, and pendent, but not excessively so—thin, smooth, free from folds, and close to the head; neck long, well furnished with hackles, and carried upright. **Body.**—General appearance light and active, large at shoulders, and tapering towards the tail; wings large, and tightly carried; breast full, round, and carried forward. **Legs and Feet.**—Legs and thighs rather long; shanks slender, perfectly free from feathers; hock clear; toes thin and well spread. **Tail** large, with well and sweeping sickles, carried high. **Size** medium, averaging about six or seven pounds. **General shape,** rather light and slender, otherwise like Spanish. **Carriage,** very alert and uprightly.

General Characteristics of the Hen

In all respects resembling those of the Cock, with the usual sexual differences, excepting that her comb falls over to one side, hiding one side of the face. There are three varieties of this breed—White, Brown and Dominique—each of which have special markings, to be competed for in classes which we trust soon to see established at our shows. The defects in Leghorns are bad shaped comb, earlobe folded, wrinkled or duplicated, stain of red on earlobe, want of hackle, squirrel tail, faults in color want of size, symmetry, and condition. The disqualifications are cock's comb twisted or falling over, or hen's erect, earlobe entirely red; legs any color but yellow; colored feathers in white, or white feathers in brown Leghorns; wry tails, or any bodily deformity; any fraudulent dyeing, dressing or trimming.

Plymouth Rocks.—Cock.

Head and Neck.—Resembling a Cochin in general appearance. Beak short and stout at the base; comb single, upright, medium sized, and neatly arched, perfectly straight, free from excrescences,

fine in texture, and symmetrically notched or serrated; wattles rather long, thin, neatly rounded, and fine in texture; deaf ears well developed and pendent; neck rather short, well arched, and very full of hackle, causing it to appear very wide at the shoulders, and tapering to the head. **Body.**—General appearance large and deep. Back broad and short; saddle very broad, with a gradual rise to the tail as in Cochins; wings medium sized, and neatly carried, well buried in the body-feathering; breast very deep, broad and full. **Legs and Feet.**—Thighs large and strong, well furnished, but not fluffy; shanks rather short, very thick, and wide apart, to be perfectly free from feathers; toes large, straight, and well spread out; tail rather small, but larger than Cochins, furnished with true sickles, but smaller than usual. **Size,** very large, ranging from nine pounds to twelve pounds in the cocks, and eight to eleven pounds in Cockerels. The general shape, massive, but compact; carriage upright and commanding.

Hen.

Head and Neck, resembling the cock's, with the usual differences. **Body,** somewhat more plump and square than the cock's. **Legs and Feet,** similar. **Tail,** rather small, and almost upright, out of a rising saddle. **Size,** averaging seven or eight pounds. **General shape,** square and massive, yet neat. **Carriage,** very plain and matronly. **In both sexes,** the beak a bright yellow; comb, face, deaf ears and wattles, a brilliant scarlet red, shanks, bright yellow, plumage a bluish grey ground, pencilled or barred across the feathers with bands of dark bluish grey, verging to black. The defects are, bad head and comb, want of hackle, bad shape or carriage of tail, primaries out of order, curved toes, white in deaf ear, faults of plumage, want of size, symmetry and condition. The disqualifications are, legs feathered, or any color but yellow, rose combs, red, white or black feathers; wry tails, or any other deformity; birds not matching in pen; any fraudulent dyeing, dressing or trimming.

Dominique Cock.

Head and Neck.—Head plain and neat, to be free from coarseness; beak medium size; comb double or rose, wide in front, and tapering into a long spike pointing backwards, and slightly upwards behind, to be flat on the top, full of points, and set firmly and uprightly on the head; wattles medium length, fine and neatly rounded; deaf ears medium size and pendulous; face as fine in texture as possible; neck medium length, and very full in the hackle, which should flow very widely over the shoulders. **Body.**—General appearance plump and square; back broad; wings medium size, and neatly carried; breast full and prominent. **Legs and Feet.**—Thighs and legs very short; the shanks rather slender, free from feathers, and clear at the hocks; toes straight and well proportioned. **Tail,** large, with fine sweeping sickles, carried rather high on the back. **Size,** medium, averaging about seven to eight pounds. **General shape,** neat and compact. **Carriage,** lively and spirited. The hen in all respects resembling the cock, allowing for sex; average weight about six pounds. **Color in both sexes.**—beak light yellow; comb, face, deaf ears, and wattles, brilliant red, eyes red or yellow; shanks brilliant yellow; plumage same as Plymouth Rocks, to be free from white, black or red feathers. The defects are, course head, faulty comb, bad color, crooked breast, want of size, symmetry and condition. The disqualifications are, single combs, legs feathered, or any other color but yellow; red, black, or white feathers in plumage, or any bodily deformity; any fraudulent dyeing, dressing or trimming, birds not a fair match in the pen—(the plumage in this colored fowl being similar in both sexes).

It is on the farm poultry ought to be most profitable; and, in such circumstances every well-chosen stock fowl should represent a clear profit of \$1,25 per annum.—*Wright.*

Publishing the Names of Poultry Judges.

We recently called attention to a serious omission on the part of the Directors of our Provincial Exhibition in not publishing with the prize list the names of the Judges, and pointed out one mistake which certainly would not have occurred had their names appeared. In England the rule of publishing the Judges' names with the prize list is pretty universal, although not conformed to by all societies. An experienced secretary of a poultry society, writing to the *Cottage Gardener* on this subject, says, "We frequently see the names of the committee, treasurer and secretary of poultry societies attached to the schedule of prizes, but seldom the name of the judge, and if an exhibitor writes to the secretary asking the name of the gentleman selected for that important office, he will mostly receive a very polite reply as follows:—'A gentleman of experience is engaged but I am not at liberty to give you his name.' Now, it is quite possible for him to be a gentleman of experience in some matters, yet his knowledge of poultry may be very limited. Some will say if exhibitors know who is to be the judge they may tempt him with a bribe; but I feel convinced the majority of our judges and exhibitors are men of honor, and will not stoop so low. There are, I admit, a few exhibitors who will do anything to win; but these few will always find out who is to judge, whether the name be published or not, therefore, to do justice to the honest exhibitor, the names of the judges should always be made known, and I am satisfied committees will find it to their interest to give publicity to the matter in future. Two of the best breeders and exhibitors in the kingdom informed me recently that they would not send their birds unless they knew who was to be judge, for they had been frequently thrown out, even when showing Birmingham cup-winners, by some of the most miserable specimens. I give one case in point. At a show, not two hundred miles from London, one of the gentlemen referred to sent two of his best pens, both of them cup-winners at several of the leading shows. They were placed first and third, and a pair only fit for the spit was second. He asked the judge why the birds were thus placed, pointing out the glaring defects of the second prize pen. The judge acknowledged he was wrong, but he did not see it thus when he awarded the prize, at the same time, saying, 'You ought to be a better judge of that variety than myself.' A few minutes afterwards the owner of the second prize pen made his appearance, and not knowing the owner of the first and third prize birds, acknowledged to a friend that he was surprised and highly delighted at winning a 30s. with his pair of birds as he only gave 7s. 6d. for them in Leadenhall Market. * * * In face of the above facts is it any wonder that many exhibitors, owning good birds, are determined to keep them at home, unless they know who is to officiate as judge."

Another writer in the same journal states, "It ought to be imperative on every committee to publish in the schedule the names of the judges. My experience, as an exhibitor and breeder of some years' standing, teaches me that it is only fair to all to publish the names of the judges. As you say, the secretary's name, and the names of the patrons, president, and committee are published, why not the name of the judge? He is the most important officer in the show. It is easy to see, in many cases, why it happens thus—the judge may have only a very meagre knowledge of fowls, and yet, because he is a friend of some of the gentlemen belonging to the show, or because he has been judging at some other show, they invite him. An objection raised to this mode of procedure is, that if the name of the judge is known, good exhibitors will not show when a man is judging whom they may think incapable of judging, and very right too. Would any man, who understands what are good birds, send his best specimens to what he may term a lottery? for sending them to be estimated by some judges is nothing more. I and other exhibitors have determined not to show if the names of the judges be not published."

Miscellaneous.

Agricultural Papers.

We clip the following from a report of J. H. Smith's address in the *West in Parson's*—

If there is a single man who bears me to say that does not take one or more agricultural papers, let me urge you not to return to your homes till you have subscribed for at least one good agricultural paper. It will be the cheapest investment that you ever made in farming. You cannot afford to do without it. And just as certainly as you make the attempt, you will find your digging behind the ago; you will be less successful than your more enterprising neighbor, whose table is ever covered with agricultural books, papers and journals. As your sons grow to manhood they will, if they have the life and energy of true born Americans, tire of the dull routine of a farm that is not improving, of a home where the business is unknown, except as it is handed down to them in company with the ignorance and errors of a past age. They can readily see their home is not a pleasant one, and they can also see that there is no prospect of its becoming a profitable one in the future. Simply a life of toil and drudgery, with but little if any chance for success either mentally or financially. Under such circumstances, I cannot blame them for wishing to seek new homes and a new business.

But, if upon the other hand, your home and your farm bears the outward marks of improvement, if there are no unsightly hedges of brush and briars growing along the fences, if the fences themselves are in good condition, if the land is underdrained where that is necessary, and is kept in such a condition that each five years shows a steady improvement in the quantity as well as the quality of the crops; if the Chester White, the Berkshire, or some other of the improved breeds of swine, have taken the place of the ill-looking brutes that inhabited many farms some years since, and, I am sorry to say, are too often found yet, if the noble Short-horns, or perhaps some other improved breed of cattle, are grazing your fields in the summer, and comfortably housed in your stables in the winter; if a noble span of horses and a comfortable carriage has taken the place of the common scrabs and the lumber waggon of a few years since; if a nice garden and a bountiful supply of fruits and vegetables for yourself and your friends; if your flower beds are things of beauty and of pleasure; if a new and more comfortable house has or is to take the place of one that was made to answer while you were making other improvements and getting your farm in condition to pay for this one; if that home is to be one of comfort and pleasure, a home where the mind as well as the body is to be fed, one where all the inmates are trained to an intelligent, active, and successful industry, instead of the dull routine of a life of daily drudgery; if such be your homes, believe me, gentlemen, your sons will not leave the farm. If they see it year by year growing into a thing of beauty, as well as of profit growing more and more attractive as well as profitable, you need not fear their leaving it.

You will not hear your daughters saying, "well, I will never marry a farmer." On the contrary, they will look upon the home farm as the dearest spot on God's green earth, and when your work is done they will still look back to father's farm as one to be imitated and improved upon, instead of a tiresome place to be got away from and forgotten.

Boiling Potatoes.

The following extract appeared in the *CANADA FARMER* some years ago, and we now republish it by request.—The lady authoress of "Uncle Tom," and divers other popular publications, has been writing a homily on cooking potatoes. I should like to know if Mrs. Stowe does really boil potatoes herself? I do, and I have long since known better than to pare my potatoes raw and then douse them naked in water red hot—boiling at two hundred and ninety horse power. That is one way to boil potatoes certainly, but not the proper one, by a very long way. Philosophy, common sense, and a month or two of practical experience over the dinner pot, teach us great deal better than that.

My dear madam, don't you know that about six-tenths of all the starch that a potato affords is deposited so near the surface, that however carefully we may pare the tubers in a raw state, we are sure to throw away the greater portion of that very material that we eat? Then, if we toss

potatoes into boiling water, unprotected by the iron coats, we have set in a second, and I hopelessly incorporated with the mass, that pernicious principle which gives the sliced potato its slightly acrid something insipid, and always objectionable flavor.

Any thoroughly potato-licked Irish woman would as soon think of committing regicide, as boiling her potatoes unressed, in the manner recommended by our literary lady cook. And there are no better potatoes, or potato cooks, any where in this world than there are in Ireland.

I tell you, fellow-bwa, wherever you go, that the correct way to cook a potato in any country, provided boiling is the determination, is to wash it clean first—let it lie in clean cold water two hours—then is all the better—dip it in cold water in the pot, without paring, boil moderately until the test fork goes smoothly through the potato without encountering a mite of core. Then drain off the water, set the pot over the fire uncovered, for five minutes, after which whip off Mr. Potato's jacket in a hurry, and send him to the table in a cello cover, piping hot—or if you are not over-fashionable and fastidious, it is preferable to serve "murphy" in his coat.

Please follow this formula a few times, and if you shall find it a pernicious practice, you shall be at liberty to consider Madame as competent to write a readable romance, as she is to cook a potato.—*Saturday Evening Post*.

How to Wrap with Wire.

In a former number of the *Agriculturist* (November, 1871) we referred to the uses to which a coil of wire might be put in a farmer's hands. In using wire for these various purposes we at first found some difficulty in wrapping the wire around such things as a broken shaft, tongue, or a spring. Indeed, the same trouble is experienced when we come to wrap a cord, even for temporary purposes, around anything that may happen to need such a strengthening. The loose end of the wire or cord is very much in the way of the operator, and has a fashion of becoming entangled, which when one is in a hurry, as is generally the case, leads to his feeling very strongly on the subject. Many years ago, in whiling away the tedium of a sea voyage, we observed the sailors wrapping marine or fine cord around the splices of the ropes as a preservative against chafing. They used for this purpose a small instrument which we found was exactly what was wanted to wrap wire around a broken buggy shaft on an emergency, and ever afterwards this little implement and a ball of wire found a place in our tool-box.

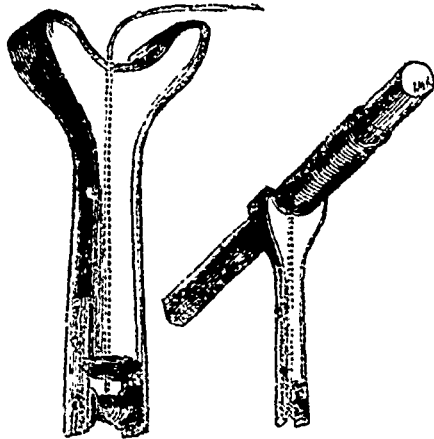


Fig. 1.—Reel.

Fig. 2.—Reel in Use.

The instrument is shown in the engraving on this page. Fig. 1 shows the form in which it is made. It may be cut out of a piece of soft wood, as pine, cedar, or basswood. A hole is bored through the centre lengthwise, through which the wire or cord is passed. The wire may be wrapped on a reel which is fastened to one extremity. From the reel the wire passes through the hole in the centre out at the bottom between the jaws, in each of which there is a groove cut along which the wire passes to the outside of either of the jaws desired. Fig. 2 shows the manner of using it. The end of the wire is fastened to the thing to be wrapped. It is then drawn tight by winding up the slack on the reel. The wrapper is then passed round and round the shaft to be wrapped, and as it is passed around it the wire is coiled. Proper tension is gained by holding the reel and allowing the wire to be unwound slowly. By pressing on the reel any degree of tightness in the wrapping may be secured. When sufficient is wound, the end is made fast and the wire is cut. Many varied uses may be found on a farm or in the house for this little tool.

A Fine Barn.

Governor Smith, of Vermont, is building a splendid barn, 100x150 feet, of brick, which is thus described in *The St. Albans Transcript*:

The central part is four storeys high, including the basement; and the whole is divided into three parts by partition walls of brick. In the central part of the first floor above the basement is the carriage room, 50x70 feet. Large weighing scales will be inserted in the floor. In one corner will be an office, and a room for steam power, with which to cut and grind the feed for horses and cattle. Running up from this floor to the fourth story, which will be devoted to the storage of threshed grain, will be an elevator, while in the opposite corner will be a feed-room.

The two rooms north and south of the one described, on this floor, are each 40x100 feet; one for cattle and the other for horses and cattle. There will be a row of stalls on each side with a wide passage way between, and doors at each end, allowing of the passage of teams through the cow stable. A shallow trench behind the cattle stalls will hold the water and absorbents, which, with the solid excrements will be precipitated into the manure cellar below.

The third floor contains three lofts for hay, estimated to be sufficient to contain 255 tons.

The basement or cellar contains three rooms, connected by large doors, allowing of the free passage of teams to all parts. Here will be conveniences for storing roots, muck &c., as well as manure.

A tank for water, sixteen feet in diameter, will extend from this basement to the roof, and be filled with water from the bay by wind power. The pressure of a column of water of that height must necessitate a tank of immense strength. A tank on each floor may be intended.

A CIRCULAR BARN.—In the *June Atlantic*, N. S. Shaler gives the following description of a large barn in a Shaker settlement on the borders of Massachusetts and New York: To me the great barn was the most interesting of their economies; it was a wonder of convenience, and more novel than any other thing I have seen here. A circular stone building, 150 feet across and 40 feet to the eaves, with a cone roof and a central lantern; a driveway from the hillside led to a huge door, through which the loaded waggons could drive to a staging which carried the roadway quite around the inside of the building. A dozen waggons could unload at once, heaping their burdens into the vast central space. Beneath the roadway were stalls for beasts, who in the long winter were to empty the great central garner. At this season it was empty, and its vast space, lighted by the central lantern, and fretted with its cobwebbed beams, was very imposing—a sort of agricultural pantheon.

TEA.—Somebody, professing to speak from long experience, avers that the leaves of the raspberry, if properly treated, make finer tea than any that finds its way to Mincing Lane. The French peasants make an aromatic drink from the leaves of the black-currant tree, and believe it to be a specific for indigestion. Thanks to M. Raspail, they have also learned to appreciate the flavor, aroma, and virtue of borage tea. Our dietetic philosopher and friend, Fin Bae, would like to do in England what M. Raspail did in France, but knowing the inveterate suspicion the poorer classes at home have of anything to which they are unaccustomed, especially if it costs little, discreetly declines making the experiment himself. "Let any social doctor," says he, "who may be anxious to test the phability of the English agricultural laborer as a pupil, accost him with the following proposition: 'My good man, I have, I assure you, from the bottom of my heart, the liveliest interest in your welfare. Now, the tea you drink is detestable, adulterated, and very dear stuff. It does you no good; now, take my advice—grow borage, which will cost you nothing, and drink borage tea. It helps digestion, is a sudorific, has a delightful aroma, and will have no bad effect on your nerves, or the nerves of your wife.' I am lost in conjectures as to the fate that would befall the doctor. He might be bonneted, gibeted into a thorn-hedge, reminded that the horse-pond was near, or recommended to confine his attentions to his own tea-cup. But the unlikely result of all would be thanks for his suggestion. No, the unlikely would be the trial of it.—*Chambers' Journal*.

Entomological Department.

The Sheep Maggot Fly.

At a meeting of the American Institute, held in New York last May, a paper on this troublesome insect was read by the Hon. L. A. Morrill, as follows:—

"Sheep during the summer months are subjected to extreme annoyance from flies, principally *Estris Ovis* or gad-fly, and the several varieties of worm, or maggot flies. Fine woolled sheep from the compactness of their wool, do not suffer from the attacks of the latter, unless from scours or wounds, but the English long-woolled varieties are especially exposed. The insects passing under the name of fly, though most troublesome in July and August, attack sheep from May to September inclusive, depositing their eggs among the wool, in general about the tail, the roots of the horns, or any part which affords, from its filthy condition, a prospect of suitable provision for the maggot. When the eggs are hatched, a process which is, in sultry weather, almost instantaneous, the maggot invades the skin, and speedily brings the adjacent parts into a fit state for the reception of succeeding members of its species. The backs of long-woolled sheep, are from their exposure, more liable to be selected by the flies as a receptacle for their eggs than the corresponding parts in such as are covered by a short, thick fleece. No sooner has the maggot begun its operations than the sheep becomes uneasy and restless, rubbing itself on fences and trees, and endeavoring by every means in its power to free itself from the annoyance. Teased by the constant irritation, fever soon sets in, and if the sheep is not relieved by the shepherd's aid, death will inevitably follow:

"It is only a few years since that attention has been drawn to the history of the insect pests which originate the mischief. In a valuable paper, containing the results of observations made on this subject in the highlands of Scotland, and published in the *Quarterly Journal of Agriculture*, they are thus described: "The flies which are so troublesome to sheep, consist of four species, viz.: The *Muscar Cæsar Cadaverina*, *Vomitario*, and *Carnaria*, of Linnaeus. *Muscar Cæsar* is of a shining green color; *Muscar Cadaverina*, the thorax shining bluish, the abdomen green, like the *Cæsar*; *Muscar Vomitario*, thorax black, or dark blue gray, abdomen dark, glossy blue; this is the common blue-bottle, or flesh fly; *Muscar Carnaria*, gray; the thorax has three black longitudinal markings on the upper surface; the abdomen is checkered. In all instances the green flies were the first to attack, and this is the common opinion among shepherds. After a time, when the maggots commenced gnawing the flesh, the putrid stench which was thereby occasioned attracted other species. The blue-bottle was very common, more numerous than both the former species, and perhaps contributed most to accelerate the death of the animal, after the others had commenced. In five days after the larvae are hatched, they arrive at full growth, provided they have plenty of food; they then cease to eat, and seek to assume the pupa state, crawling under the ground two or three inches. Here they remain about fourteen days, when the shell cracks, and the imago, or fly, appears. The correctness of this description of their transformation Blacklock attests, from having watched their habits during his anatomical pursuits in the summer months. To ward off the attacks of flies, various substances obnoxious to them have been recommended. Tar, with spirits of turpentine, may be applied about the ears, horns, and tail; while others prefer a little melted butter or lard, thickened with flour of sulphur, put along the sheep's back, which is, on the authority of Blacklock, an effectual preventive. I have preferred a mixture of tar and turpentine to anything else, as nothing is so abhorrent to all insects as the odor of turpentine. Sheep farmers cannot be too vigilant during the summer months, and if any of their flocks are affected with scours or wounds, they should be got up without any delay and the above application made. Rams should be still more closely watched, especially the Saxons and Merinos, whose pugnacious tempers incline them so frequently to battle, often inflicting wounds around the bases of the horns which are certain to call the flies. Many valuable rams have been lost from this cause, which watchfulness might have prevented.

Noxious Insects.

The Hessian-fly (*Cecidomyia destructor*) has made its appearance in the neighborhood of London, Ont., and has done a great deal of injury to the spring wheat. The Colorado beetle (*Doryphora decemlineata*) is very abundant throughout Western Ontario, but, we are happy to say, is being well kept down by the intelligent farmers of that district, who wage an exterminating war upon it with Paris green. In its eastern progress it has nearly traversed the Province of Ontario, but not yet in sufficient numbers to occasion much diminution in the potato crop. To the south-east we learn that it has invaded Maryland and Pennsylvania. In the neighborhood of London and Guelph, Ont., we observe, with great regret, that the locust trees are being rapidly destroyed by the ravages of the borer (*Arhopalus robinie*, Forster). Young Apple and Mountain Ash trees are also suffering grievously from the attacks of the *Duprestis* borer (*Chrysobothris femorata*, Fabr.) About Port Hope, Ont., this summer, the Forest and American Tent caterpillars (*Clisiocampa sylvatica* and *Americana*) have been more than usually numerous and destructive.—*Canadian Entomologist*.

ANTS ON LAWNS have been checked by using flour of sulphur where boiling water cannot be used.

PERIS RAPE.—This destructive pest of the cabbage and allied plants has now come as far west as Port Hope; it is almost as abundant in our garden as the common *Colias philodice*. No doubt it will proceed as far as Toronto before the close of the season. We have not yet perceived any particular depredation from its larvae in the kitchen garden, but we fear that we shall not long enjoy this immunity.—*Canadian Entomologist*.

POISONING BY PLANTS AND INSECTS.—A standing antidote for poison by oak, ivy, etc., is to take a handful of quick-lime, dissolve it in water, let it stand half an hour, then paint the poison parts with it. Three or four applications will never fail to cure the most aggravated cases. Poison from bees, hornets, spider bites, etc., is instantly arrested by the application of equal parts of common salt and bicarbonate of soda, well rubbed in on the place bitten or stung.—*Boston Journal of Chemistry*.

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