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THE CANADA FARMER

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The Field.

Buckwheat.

This plant belongs to a class to which the botanical name *Polygonaceæ* is applied. The rhubarb, sorrel dock, and knotweed belong to the same family. Buckwheat is not properly a cereal, though it produces a seed which is edible, and forms, indeed, a wholesome and nutritious food for man. There are several species of this plant that yield grain; the one in common cultivation being known among botanists as *Polygonum fagopyrum*. It is called *Polygonum* because of the angular form of the seed, and *fagopyrum* from its resemblance to the beech-mast or beech-nut. The name buckwheat is a corruption of the German *buch-weizen*, which signifies beech-wheat, from the similarity of the seed to that of the beech-tree. It is called wheat, because the grain when ground produces a fine farina, not unlike that obtained from wheat.

The variety of buck-wheat now in common use is said to be found wild in Persia. According to some authorities, it was introduced into Europe by the crusaders, others say the Moors brought it into Spain from Africa; and hence it has in France the name of *blé Sarrasin*. In China, Japan, and Russia, it forms a considerable part of the food of the inhabitants. It is also consumed largely in Switzerland, and the southern parts of France. In Flanders, much attention is given to its culture. It seems to have been considerably cultivated in England towards the close of the sixteenth century, especially in the counties of Lancashire and Cheshire. It does not seem to have made great progress in Britain, and though it is often used for ploughing under as green manure, has received less attention than it is entitled to. Considering its many excellent qualities, it is rather surprising that it is not more highly appreciated as an article of food. It is largely grown in the United States, and "buckwheat cakes" are considered a delicacy in all parts of that country. It is grown and used for human food only in those parts of Canada where American settlers or their descendants have located. Old country people seem, in many instances, to have conceived a prejudice against it. Two peculiarities recommend it for culture and food in northern latitudes: the first is that it requires but a short season for growth and ripening, the second that "buckwheat cakes" have a warming property, very grateful and wholesome to the system in cold weather.

The seeds of buckwheat form an excellent food for cattle. Many dairymen use this grain largely for milch cows. Others only feed the bran to their cows and sell the flour. This practice is said to increase the quantity of the milk, but very perceptibly to lessen its richness, so that in reality it pays to feed the grain in its entirety to milch cows, unless indeed the dairyman belongs to the class who count in the pump as their best cow, and go in for quantity only, believing that "milk is milk anyhow." It is also a good green forage plant for cows and other cattle, and is by many cured like hay for winter use, but the curing process is difficult, and the value of the dry plant for fodder small. Buckwheat is very fattening for poultry and hogs. It is often sown in England to encourage game, particularly pheasants, which are very fond of it. Among its other good qualities it forms, when in blossom, excellent bee pasturage. It does not, indeed, make first-class honey for table use, but the apiarian who has buckwheat to count on, can appropriate the honey got from white clover, basswood, &c. to his own use, leaving the bees to help themselves to a stock of that yielded by buckwheat blossoms. The recent invention of the honey-emptying machine renders this quite easy of management and greatly increases the value of the buckwheat as a honey plant.

One of the most useful purposes to which this plant may be applied is ploughing down to increase the fertility of the soil. It is less valuable for this purpose than clover, but then it requires less time for its production, and will grow on soil too poor to raise clover. For green manure, it should be sown tolerably thick, and turned under when in greatest vigor and full blossom. There is no difficulty in ploughing it under neatly, if a logging chain or skim coulter be used to bend the green mass ahead of the plough. In England a very high value is attached to this crop as a green manure. "We cannot" says an agricultural writer in that country, "too much recommend the employment of this precious plant as a manure. It is certainly the most economical and convenient the farmer can employ. A small quantity of seed costing a mere trifle, sows a large surface, and gives a great crop. When in flower, first roll and plough it in, and it is soon converted into manure." It is also an excellent cleanser of the soil, its dense rapid growth giving it the start of all weeds, and enabling it to smother them down most effectually. It is said to be an exterminator even of couch-grass, and that is the highest praise it could possibly have as a weed-killer. Poor, sandy soils are often reclaimed in Britain by sowing buckwheat to be ploughed under as manure for first crop of turnips. The turnips are then fed off to sheep, whose droppings will enrich and consolidate the ground sufficiently for a crop of wheat, or of clover and grass seeds. When buckwheat is cultivated as part of a regular rotation of crops, it comes in after the land has been somewhat exhausted by preceding crops of grain, and is resorted to when there is a lack of manure, as there usually is. It yields a better return than oats, and leaves the land in higher condition. The fact that a fair crop of buckwheat can be got off poor soil, is taken advantage of by some slip-shod farmers, and land is put through the last stages of exhaustion, until at length, "too poor for buckwheat" is the phrase descriptive of its utterly worn out condition.

Buckwheat is of easy culture, and but few directions need be given for its management. It does best on light sandy soils, though almost any soil will produce it, and should be grown without direct application of manure, which tends to promote a too rank growth of haulm or straw. Being a native of warm latitudes, and very susceptible of injury from frost, it should never be sown until settled warm weather. It may be put in any time from about the tenth of June until the middle or end of August. In order to a good crop of grain, cool nights and hot days are necessary; it should therefore come into bloom after the extreme summer heat is passed. With favorable weather, it comes on very fast, maturing in nine or ten weeks from sowing. From three pecks to a bushel of seed per acre, will suffice. The better the land, the less seed should be sown. It will yield from twenty-five to thirty bushels to the acre, ordinarily, though under specially favorable conditions, a far larger yield may be obtained. Early in the season, a more luxuriant growth of straw, and a smaller yield of grain will be had than if sown later. As many as three crops have been grown and ploughed under in a single season. When the object is thoroughly to clean and reclaim, foul, weedy, or poor land, nothing is better than ploughing down successive growths of this plant. This course has all the advantages of summer fallowing in both cleaning and enriching land.

Buckwheat is usually cut with the scythe, though it is better done with a cradle, so as to bind the crop in small sheaves. The seed is but loosely held on the stalk when ripe, and hence care is required in harvesting it, lest a large portion of the produce shell out and be lost, or what is worse, in some cases re-seed the ground. Want of care in harvesting the ripe grain, has led to an objection to this crop, on the ground that it is difficult to get it out of the soil. Some prefer pulling to cutting buckwheat. If thus harvested, and the work done when the dew is on the plants, but little grain is wasted. It dries slowly and should be threshed as soon as it is in proper condition, since there is danger of its heating. The best way is to thresh it as fast as it can be drawn from the field, on a sunny day. Some years since, quite a controversy was carried on in the agricultural papers as to the safety of feeding the straw to stock. In some instances, it was testified that it had been found unwholesome for sheep. But these cases were very few, and the probability is that not all of them could fairly be attributed to the supposed cause. Some high authorities urged the opinion that where unfavorable effects could be traced to the use of buckwheat straw, it was owing to a deficiency of lime in the soil on which it was grown. It is certain that a good supply of lime in land is necessary to the best results in growing this crop.

What is Known about Beans.

A correspondent of the *Agriculturalist* says that, for some years past, taking one year with another, beans have proved the most profitable crop on his farm; that they occupy the land only eight or ten weeks, and are harvested in time to sow winter wheat. No special skill or peculiar treatment is necessary in raising them, but some care and experience are required to harvest them. The real point is to have the land clean, mellow and in good heart. The old saying, "too poor to raise beans," has led many astray. They have planted beans on land such as was not considered rich enough or dry enough to raise corn or small grain crops. And the result, in nine cases out of ten, is just what any one might expect—abundance of weeds, a light yield, and an inferior or mildewed sample of beans, fit only to feed sheep.

A crop of beans of thirty bushels to an acre that has to grow and mature in so short a time, must have a liberal supply of available food, and the soil must be in the best condition. A fair crop of beans is sometimes raised on soil so hard that it would seem that the roots could not penetrate it; but a maximum yield cannot be expected unless all the conditions are favorable. The most common mistake is in trying to raise beans and weeds on the same land at the same time. The writer has seen part of a field cultivated and hoed, and another part of equally good land, left uncultivated and the latter produced less than one-third of the former. The extra cost of pulling the beans out of the weeds was more than it would have cost to cultivate and hoe them. The beans on the weedy land did not mature properly, and could not be sold at any price. The most profitable crop he ever raised was on a two-year-old clover sod, ploughed in June, turning under clover equal perhaps to more than half a ton of hay an acre. The beans were drilled in immediately after the ground was ploughed and harrowed. There was a rain shortly afterwards, and the beans came up and grew rapidly. They were cultivated four or five times, but needed scarcely any hoeing. The yield was over twenty bushels an acre; and the beans brought $3 25 a bushel. The land, after the beans were off, was ploughed and sown down to winter wheat, and produced a good crop.

A friend having read the above, says that his own experience fully accords with every statement, and adds that in the season of 1863 he raised twenty-three bushels of the "blue nod" variety on three-quarters of an acre of light and rather sandy soil, and sold twenty-two bushels for $66. He believes that he never raised any crop that paid as well. The land should be prepared for the crop by spreading finely composted manure before ploughing the first time. The soil should be cross-ploughed just before the seed is put in, and as little harrowing done as possible, so that the ground may be as light as circumstances will permit. The drills should be three feet apart, so that the vines may cover the whole ground when fully grown, thereby depriving the weeds of the benefit of light and heat. The time of drilling should be from May 20 to the first week in June. If manure or compost is used in the drills too much dirt will adhere to the roots when pulled and will only come off when the beans are threshed. Any process which facilitates the cleaning of beans should be adopted. In a favorable season beans will mature in this climate in ten weeks; but ordinarily our correspondent thinks twelve or thirteen weeks are required. In this country winter rye should be sown instead of wheat, and as soon as may be after the beans are removed. If it is possible the beans should be dried on the ground and beaten out as they are brought from the field, as they will come out more easily then than afterwards. No crop leaves the ground in a better condition for winter wheat or winter rye; and as rye straw sells readily for $18 or $20 per ton, he commends the attention of farmers to this very important subject.

Transplanting Large Maples.

A few days since, while passing along one of the unfrequented roads in a wild region of country a few miles from my home, I found a handsome row of sugar maples which some former owners of the place had planted on the roadside. These trees were from four to eight inches in diameter at the base, and straight as an arrow, with finely formed heads. As I wanted fifteen just such trees for a particular purpose, I ventured to ask the present owner of the dilapidated looking place his price for the trees. Judging from the surroundings of the dwelling and out-buildings, I did not think the proprietor had sufficient good taste to fully appreciate such beautiful ornaments, and in this I was not mistaken; for when I asked if he would sell, he answered, "Yes, if a man gives me my price." He named it, and I closed the bargain at once.

To-day, April 22, I have been transplanting these trees; and although so very large, I have no fear of losing them, for they had but few large roots, the greater part being small fibres, which are of far more importance than coarse, large ones. In digging I struck a circle seven feet in diameter, and all roots passing beyond this boundary were cut off and all within carefully preserved. The trees had to be loaded upon waggons and hauled about five miles to the place where they were planted; but during this operation the roots were kept covered with sacks and sprinkled occasionally, to prevent drying. In planting, fine, rich soil was carefully worked in about the roots and packed firmly, and over the surface of the soil I shall now place a mulch of coarse stable manure. This will not only aid in keeping the soil moist, but the juices of the manure will be carried down to the roots by the rain. I consider that mulching with manure is a far better plan than putting it into the ground, where it is likely to come in direct contact with the roots. Of course a portion of the branches of every tree was removed, but only in proportion to the quantity of roots destroyed. The ends of every root cut off or broken with the spade, was carefully cut again either with a sharp saw or pruning-knife. New rootlets will issue far more speedily from the end of a root, the cells of which have been smoothly severed than from one crushed or broken off.—*Rural New Yorker.*

Transplanting in Windy Weather.

I have always found it a difficult matter to make workmen understand the importance of protecting the roots of plants that were being transplanted in windy weather. Small delicate plants are soon destroyed if exposed to the hot sun and drying winds. Large trees will also be greatly injured if exposed only for an hour, and many a fine healthy specimen has been destroyed by exposure, while a hole was being dug for its reception. I have seen trees scattered about over a field in the morning, and there left exposed to drying winds until planted, the same or the following day. If the trees died or failed to make a good growth, the nurseryman, soil, or season was blamed, but never a word said about carelessness at the time of transplanting. One morning, last spring, I passed a gentleman's place where one of our would-be-great landscape gardeners was superintending the planting of a choice lot of evergreen and other trees, which had just arrived from a well-known nursery. Not a hole had been dug, or other preparations for planting made, but trees were scattered over the place, each specimen thrown down near where it was to be planted, not a root covered or even sprinkled with water, although the wind was blowing almost a hurricane at the time. Late in the evening I passed that way again; the larger portion of the trees were still lying in the same position, only a very few having been planted. I learned, a few months after, that the trees had died, and the purchaser refused to pay for them, and I believe the case is still in the courts. This is but one instance in hundreds that have come under my rather limited experience in noticing what my neighbors are doing; consequently, I do not always feel like taking sides against the nurserymen, even if they do sometimes make mistakes (purposely or otherwise) in filling orders for trees. Too much care cannot be given to the protection of the roots of trees while being transplanted. They should always be kept covered with some damp material, such as hay, straw, moss, or old cloth, and not be uncovered till the moment arrives to place them in the soil. It is to carelessness in such matters that most people are indebted for the greater part of their failures in tree planting.—*Cor. Rural New Yorker.*

Low Headed Trees.

The *Horticulturist* says: The tide of favorable opinion for heading fruit trees low for orchard culture, is now experiencing a revulsion. Orchardists who cultivate their orchards, and are in the habit of ploughing or stirring the soil periodically, say low headed trees will not answer. It is impossible to approach near enough with the horse and implement, and hence the high standard methods of training will hardly be given up. Low training will answer for garden culture, and for orchards where there is a good deal of hand labor. Apple and peach trees must be trained high, but pears, we believe, are best if grown on the pyramidal system, and this must be low to attain success.

Nitrate of Soda.

Mr. J. B. Lawes, says: The only two substances really required in artificial manures are:—

1st. Nitrogen, and 2nd. Phosphate of lime.

Nitrogen is useful in three forms:

1st. As nitric acid. 2nd. As ammonia. 3rd. As organic decomposable matter, yielding ammonia, or nitric acid.

Nitrogen is more valuable in the form of nitric acid than it is as ammonia, and ammonia is more valuable than decaying substances yielding it. The best possible manure for all gramineous crops, wheat, barley, maize, oats, sugar cane, rice, pasture, grass, is a mixture of super-phosphate of lime, and nitrate of soda; 300 lbs of super-phosphate of lime and 275 lbs. of nitrate of soda applied every year to one acre of ordinary English land, has for twenty consecutive years given a produce annually of 6 quarters of barley, 14 tons of farm-yard dung applied annually over the same period has given the same produce of barley. Super-phosphate of lime is a special chemical manufacture which can be made cheaper on a large than on a small scale, and therefore farmers ought to purchase it cheaper than they can make it, but it is better to make up their own compound manures, purchasing their nitrate of soda or salts of ammonia. It is not advisable to sow artificial manure with beans, peas, tares or other leguminous plants. Corn and root crops will take all the artificial manure which the farmer can afford to pay for. Super-phosphate of lime should always be placed under the soil, either by drilling or harrowing in when the seed is sown. Nitrate of soda may be sown in the same way, or it may be sown broadcast when the crop is up. The increase in the growth of the cereal crop is much more dependent upon the nitrogen supplied than on the phosphoric acid. Potash is generally found in sufficient quantities in soils and the artificial supply is not required.—*Ex.*

European Larch.

There is hardly a purpose for which timber is used, for which larch cannot be profitably employed. Its importance in ship building cannot be over-estimated; it is tough, durable and light. A shot hole through larch closes, and will not splinter, while its incombustibility peculiarly recommends it for ships of war. It can be used in house building from the sills to the ridge pole, while for flooring it has no equal, especially for barns and ridges or any place where there is much wear and tear. It is used for ploughs, harrows, waggons and carts, in the construction of almost all agricultural implements and machinery, for railroad ties and fence posts, the old historic hedge rows giving place to posts and wire fence. It has such a fine grain, and is so exempt from cracking, that painters use it for their palettes and to paint pictures on; for this purpose it was used by the ancients; several of Raphael's paintings are on larch wood. Its beautiful color, and capability of high polish adapt it well for cabinet work.

Besides the value contained in its timber, its bark is used for tanning. It is from the larch that Venice turpentine is produced.

That mixed planting in certain circumstances will be adopted there is no doubt, but that one particular tree for general timber purposes will be selected for planting is just as certain. The larch is that tree in Europe, whether it or the American larch, (tamarack,) or some other tree, is to be the timber tree of America, it is high time it should be decided.—WILLIAM HILL, *Western Rural.*

FERTILIZERS FOR POTATOES—PLOUGHING OUT.—W. J. Pettee inquires as to the best fertilizer for potatoes to be applied in the hill—whether bone, phosphate of lime, or fish guano. In the last twelve years I have tried a great many experiments in reference to the best fertilizer for potatoes, and have seen many more tried. I have found invariably that the best yields were got by applying coarse manure as a top-dressing on the hill after planting. Take a good clover sod; have it well drained (this is indispensable in such a wet season as the last); plant in hills about three feet apart; give a good top-dressing of coarse manure of two good forkfuls to each hill. Tend well and do *not* hill; get a growth of top that will cover the land at the time the tops fall to the ground, and a glorious yield is insured. I have known this amount of top-dressing more than double the crop. Mr. Pettee also inquires as to the feasibility of discontinuing the plough in digging. It is the opinion of potato raisers here, that a plough is more bother than benefit. E. A. K. *Cayuga Co.*

Agricultural Implements.

DRILLS—*continued.*

For hand use, the Harrington (Mass.) Single or Combined Seed Sower and Hand Cultivator has been found to do excellent service, and it is claimed for it that it is the only one which will sow beets and parsnips with regularity. As a sower it will also distribute guano and other fertilizers, and it has no slides, reeds or brushes to get out of order. It makes the drills, and evenly drops and covers the seed. Fig. 1.

The removal of the hopper and its accompanying parts from the frame, and the substitution of the cultivator attachment, will change the implement speedily into a hand cultivator. Fig. 2.

The Eagle Seed Sower, made in Massachusetts, is also a very complete one of its class. It drops the seed by the reciprocating motion of the seed-box, so that, as in the Harrington, there is no need for brush or cylinder, and this box-motion, keeping the seed in constant agitation, prevents the clogging of the outlet.

The implement is made in Nos. 0, 1, 2, and 3. The two first are of simple structure and small, better adapted for the smaller seeds than for corn, beans, &c.

Nos. 2 and 3 are provided with hinged ploughs, and hill-dropping attachments for planting corn, beans, peas, &c., in hills. The wheel is furnished with adjustable catches on the opposite side of the drills, so arranged, that 2, 3, 4, or 6 catches can be applied to drop at different distances.

The rod on the box-board, engaging with the catches on the wheel, raises the box, and a slide is drawn in which fills the measure. As the catch slips off the rod again the box is lowered, and the measurer emptied in the hill.

The drops are arranged to work in differences of 5 inches, from 10 up to 40 inches. The rod is also constructed so as to throw itself out of gear when the drill is drawn backwards, and the box may be taken off to be emptied.

An excellent rustic hand drill for turnips or carrots is made thus. Take a circular piece of inch board about 18 inches through; thin off the edge slightly and bore an inch hole in the centre. Take then another piece of wood 3½ or 4 feet in length, out of which manufacture your handle; drive an inch hardwood pin through it, about two inches from the ground end, and upon this pin, as axle, let your circular board revolve—secured, of course by another pin to prevent its coming off. Next take a common tin custard-dish or small shallow milkpan, say 12 or 14 inches in diameter, and around its upper rim punch small seed holes, or cut out notches sufficiently large to answer the same purpose, and keep them about 3 or 4 inches apart. Fasten this dish, bottom outwards, securely on the side of your wheel-board opposite to that along which the handle runs, and your implement is complete. A hole in the bottom of the tin, which may be opened or closed by means of a plug, serves for the purpose of filling or emptying.

To use this implement, you simply run it along the top of your drills, beds &c. Its own weight and the sharpness of the wheel edge causes it to sink into the ground an inch or two, and thus the seed-rut is made; at the same time, the seed keeps pouring out in the proper quantity and at intervals of 3 or 4 inches.

If holes a little larger than those used for turnip seed be punched between every two of the former, they will answer for carrot seed, and may be plugged up when the implement is required only for turnips. We have known an implement such as this to give so much satisfaction that it was borrowed for years over a whole settlement.

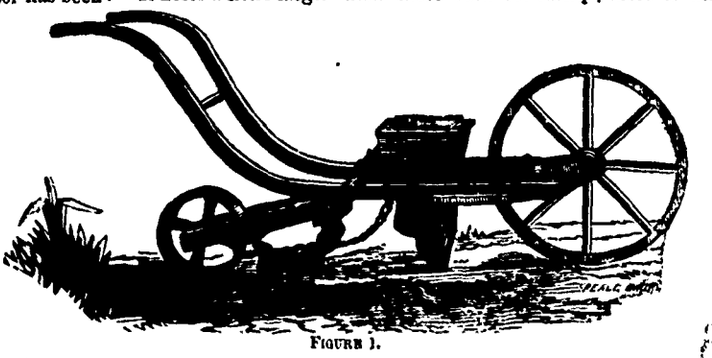


FIGURE 1.

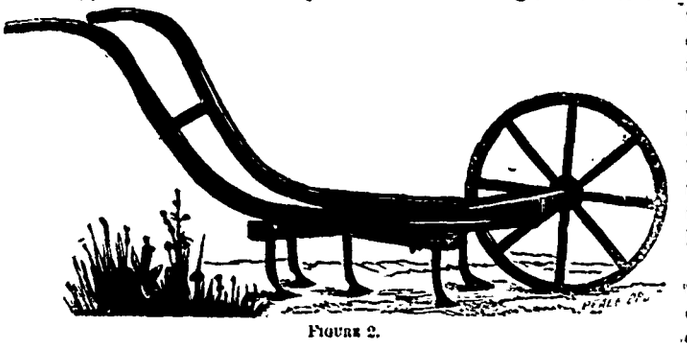


FIGURE 2.

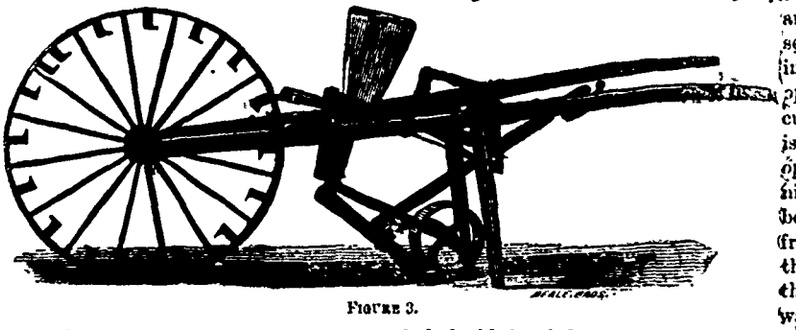


FIGURE 3.

The smaller seed-drills may, in general terms, be divided into three classes: 1st, single-handed drills, to sow one row at a time; 2nd, double-handed ones, for the same purpose, and 3rd double-handed ones for 2 rows at once.

Very good implements of each class are now made both in Canada and the United States, though we look for as great improvements yet to come in them, as in any of the implements of husbandry. Although the 2nd class drill, viz.; the double-handed implement for one row, seems to be in general a favorite, there is still an objection to it, which we have heard often repeated and that is, that in working it, the operator has to step along with a foot on each side of the drill, a proceeding which, if continued for any length of time, becomes very tiresome and annoying. Single handed drills are got up in such variety that separate descriptions seem almost an endless job. The main object in selecting one is to see that the seed can be regulated in quantity as exactly as possible, and that there is no clogging in the delivery. A double-row horse drill which gives much satisfaction to Canadian farmers, is constructed on a principle originally Scottish. The drill consists of two transverse hardwood bars, about 2 in. square, and about 8 or 10 inches apart, the ends of which are fastened into castings which widen as they descend, to serve for the insertion of the ends of two different iron axles, also transverse, one in front and the other behind.

On the front iron axle are two hollow rollers to shape the tops of the drills. These also slide on the axle to suit any unevenness in the ridges. On the hinder iron axle are two plain rollers to cover in the seed and roll the drill, after the seed has been deposited.

The seed-boxes are fastened above to the wooden bars, and within them two conical tin seed-canisters revolve. These canisters are connected by a small iron-axle, which stretches across the seed-boxes, and is driven by a belt passing over a centre-pulley to a corresponding pulley in the centre of the hinder iron axle. It will thus be understood that the canisters are driven by the hind rollers. The seed delivery consists of small holes in the periphery of the canisters, opened and closed by means of a circular tin band or slide, and this band is so adjusted, that any set can be opened, from the smallest size for turnip seed, to a size large enough for beets, or mangel wurtzel. An iron frame work also in connection with the front rollers communicates with the delivery tubes behind, in such a way that when the rollers spread apart or come together, the seed tubes will do the same, thus keeping the seed constantly in the middle of the furrow.

By simply raising the handles of this implement at the ends of the drills, the entire seeding apparatus is thrown out of gear. A couple of small iron handles also extending backwards enables the operator to raise any or all of the seed tubes to pass an obstruction.

Another form of the same machine differs from the foregoing in the driving apparatus, which, instead of a belt, consists of two pulleys, one near each end of the canister-axle, working by friction against the surfaces of the two front rollers. An objection was raised to this scheme however. It was that, 1st, the friction surfaces of the ground rollers, working continually in the soil, became in time gummed up with it, thus preventing a uniformity of work; and 2nd, there was no guarantee that the seed-canisters,

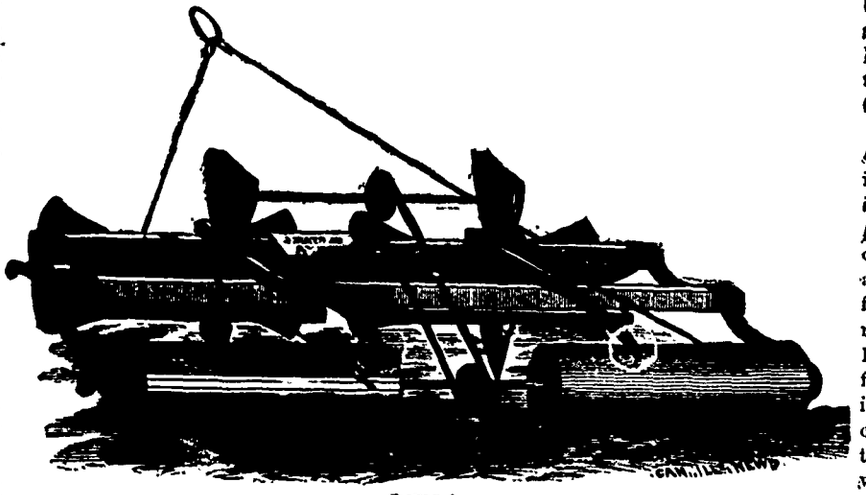


FIGURE 4.

simply by their own weight and that of the pulleys attached to their axles, would constantly remain in their proper positions, but rise and fall with the jarring of the implement, especially on rough ground

To obviate these difficulties, another improvement has recently been made, viz., the friction surfaces of the front rollers are now about 2½ or 3 inches in from the outer circumference, *i. e.*, the diameter of the roller proper is between 5 and 6 inches greater than that of the portion of it which comes against and drives the seed pulley. And again, short iron levers with heavy heads are so adjusted, one at each seed-box, that they keep the canisters invariably in their places, whatever the nature of the ground may be. We might mention that an implement constructed on this last principle took the first prizes at the Provincial, Central, and Western Fairs, last year.

Grasses and Forage Crops.

Turnip Culture.

It might reasonably be supposed that, at this time of day, argument in favor of a turnip crop, was quite unnecessary. But the public is a dull scholar, needing much and frequent instruction The fact is patent, that comparatively few of our farmers raise this valuable root, while a still smaller number understand what they are about, so as to do it well The majority of Canadian farms are still innocent of a turnip field; and where such a thing is to be found, it is, in many cases, so badly cultivated that it might almost as well be wanting altogether. Nevertheless, there are those who appreciate the turnip crop, and know right well how to grow it. We are happy to believe that this class of farmers is on the increase. They are to be found chiefly in those parts of the country in which intelligent British farmers have settled. Having witnessed the excellent effects of turnip growing in their native land, they have practised it with like results in the land of their adoption, and have thus disproved the idea entertained by some, that the climate of this country is not adapted to this crop. It is remarkable to how small an extent the turnip is grown in the United States Doubtless one great reason for this, is the prevalence of the idea just mentioned There can be no doubt that the moist and equable climate of Britain is peculiarly favorable to this crop. Nor need it be denied, that the summer droughts to which we are liable, constitute a difficulty, perhaps the greatest we have to surmount in turnip-growing. But the success of multitudes in all parts of Canada has been so marked, that it ought completely to dissipate the idea that this climate is unsuited to the turnip. Competitions instituted by Agricultural Societies, have proved that with careful culture, in an ordinary season, from six hundred to one thousand bushels per acre can be grown, while examples are on record of even larger yields having been obtained. We remember an instance reported in this journal some years since, of a Markham farmer who grew, on six acres of land, 6840 bushels, or 1140 bushels per acre, a quantity which at ten cents per bushel—a moderate valuation—amounted to the handsome sum of 684 dollars. What some have done, others may do It is matter of regret, not only that turnip-growing is so infrequent, but that it is so sectional There are localities where this crop receives a fair share of attention, while there are many more, equally suitable, where it is lost sight of altogether In view of the present state of agriculture in this country, we know of nothing so likely to promote improvement as turnip-growing. It has well nigh revolutionized British Agriculture Mr J C. Morton, a very high authority, says, "Had the turnip continued to be what it originally was, a mere garden plant, cultivated only for culinary purposes, it is no exaggeration to say that Britain would not have occupied the high position she now enjoys among the nations of the earth, whether as regards agriculture or commerce." Turnip growing would be as life from the dead, to our exhausted lands, and its general adoption would mark a new era in the history of Canadian agriculture

Advantages of the Turnip Crop.

Turnips in Britain have superseded the old fashioned summer fallow, and for this reason are often called a fallow crop. What an immense gain there must be in permitting no land to be idle. Experience has shown that it is highly advantageous to raise alternately a deep-rooted plant like the turnip, and a surface-rooted crop like wheat and other grains. The deep-rooted plants draw up from the lower strata of the soil valuable nutriment, and leave a portion of it on the surface, where it can readily be reached by the shallow-rooted plants. Moreover the broad turnip leaf attracts and absorbs moisture and fertilizing material from the atmosphere, which it returns to the land along with the nutriment obtained from the sub-soil, in the form of manure. The clean and high culture necessary to this crop, rids the soil of weeds, and leaves it well mellowed, rich and in the best possible condition for a grain crop Turnips furnish a welcome, wholesome, nourishing, green food for stock at a time of year when there is nothing else of the kind to be had Growing stock will do better on straw and turnips, than on hay alone The manurial value of the straw is greatly increased thus, while its decomposition is hastened by the pectic acid of the turnip Hence to mix turnips and straw is an excellent method of feeding. It is not the least advantage of this crop, that it may be attended to after the hurry of the spring's work is over. Our season is a hurried and short one. Swede turnips do well put in in the middle or latter part of June, and the white varieties in July We say then to all our farming readers, do not fail to put in some turnips. A small patch is better than none. Who cannot, if so inclined, prepare and sow at least *one acre?* Should that yield but six hundred bushels, it will suffice to feed three milch cows, or other cattle, a bushel per day from the 1st. of December to the last of May Or it will furnish half the quantity to double the number of animals. A single trial will decide any sensible farmer never again to miss the opportunity of raising this valuable root.

Soil and Preparation.

Excellent returns may be obtained from newly cleared land. On this the seed must of course be sown broad-cast, the nature of the case preventing drill-culture Loosening the soil with a drag, and harrowing in the seed with brush, constitute the whole process of putting in the crop on new land In the case of older land, very thorough preparation is necessary The turnip will grow in any good soil, but a mellow, well-pulverized loam suits it best. Land intended for this crop, should be deeply ploughed the previous fall, and either thoroughly cultivated, or re-ploughed in the spring. A liberal application of manure should be given. There is nothing better for this crop than common barn-yard manure, which should be thrown together at least a month or six weeks before it is put on the land, as the turnip likes well-fermented dung, "hot and strong, as the phrase is, among farmers and gardeners When it can be so managed, we believe it is preferable to have a good supply of thoroughly rotted manure for this crop, and to add an artificial stimulant when the seed is drilled in. Bone-dust, super-phosphate of lime, and guano are excellent for this purpose The land having been duly mellowed by ploughing or cultivating, ridges should be thrown up about two feet apart, and lightly flattened down by rolling, to facilitate the sowing of the seed Some farmers advocate flat culture of the turnip, but the ridge system is certainly preferable. It provides a deeper bed of soil for the turnip root than can be had on the general level of the field; admits of stirring the soil for the destruction of weeds before the turnip plants are well up; and facilitates the process of thinning out. It is a good plan, if there be time, to let the ridges remain a few days after they are first made, and then split them with a double mold-board plough, just before the seed is put in. By this means many weeds that have begun to grow are killed, and the soil is rendered mellow.

Seeding.

There are several varieties of the turnip. The Improved Purple-top, Skirvings, Laing's, Matson's King of Swedes, and Sharpe's Improved, are all good kinds. Skirving's turnip belongs to the tankard class, and is rather apt to grow long and very much out of the ground. Laing's is a good, firm, round turnip, but is thought by many to yield less heavily to the acre than some others. Sharpe's Improved has acquitted itself as one of the very best in turnip matches that have come off in the County of Wellington. The Yellow Aberdeen and White Globe may be sown somewhat later than the Swedes. They are useful to re-sow patches that have failed, but will not keep through the winter as the Swedes do. The quantity of seed per acre is from a pound and a-half to two pounds. It is well not to stint the seed, as it is cheap, and it is easier to thin out the plants, than to fill gaps Sowing by hand is a tedious affair, especially when a large breadth is to be put in, and therefore it is advisable to make use of a seed-drill This is not a costly implement, and is a great economist of time and labor.

After Culture.

No sooner is the seed fairly in the ground, than the fight with weeds begins. A great advantage will be gained over them by cultivating between and along the ridges, while the turnip plants are small, and even before they are up, it being of the greatest importance to prevent the weeds getting a start. So soon as the young plants are of sufficient size, the operation of thinning, or as it is sometimes called, "singling" them, should be performed. It is a very common mistake to defer this too long. When the plants have leaves that measure an inch across, thinning should be commenced. This is usually done with an eight or nine inch hoe, in the use of which, with a little practice, one becomes quite expert, so as to go over the ground very rapidly. But the best method, and that practised by the most intelligent agriculturists in Britain, is *hand thinning.* It is somewhat slower than thinning with the hoe, but it does not loosen and lay the young plants, and it gives opportunity to select the best and strongest ones for a crop The way to do it is this, at every proper distance for a plant to be left, a good sized one is laid hold of with the left hand, while the right seizes and pulls out those that are unnecessary. This work is largely done in the old country, by children, so that the expense of it is trifling. Any farmer with a large family of boys and girls, will find his account in letting them do this job. Hand thinning will not dispense altogether with the use of the hoe Soon after it has been performed, it is needful to go over the ground with the hoe, for the final extermination of all weeds. With favorable weather, the young plants now thinned and cleaned, make rapid growth, quickly covering and shading the land with their broad leaves and requiring no further attention until the close of the season.

The Turnip Fly

This insect pest is a great source of injury and loss to the turnip crop. It attacks the young plants, in the "brairding" or springing stage, deserting them when far enough advanced for the rough leaves to form. Various expedients have been resorted to, with a view of preventing the depredations of this insect. Steeping the seed in oil and afterwards dusting it with sulphur before sowing, has been found of use. Fresh lime thinly strewn along the rows of the young plants, is a still more effectual remedy.

Some recommend a mixture of lime and soot. The use of a long-haired hearth brush, lightly sweeping it along the young plants, to shake off the flies immediately followed by a dusting of quick-lime, is a good plan when the insects are numerous. Sowing a small quantity of white turnip seed in the hollows of the drills, will attract the flies from Swedes, as they prefer the white ones. But after all, the surest method of combatting insects, is to push forward the growth of the young plants by the use of stimulating manures at the time of sowing, and to keep the soil well stirred by timely after-culture.

"Finger and Toe."

Occasionly a disease to which the above name has been given, makes its appearance among turnips. Instead of a good, solid, round bulb forming, the root goes off into forks, and amounts to nothing. Defective seed is thought to be sometimes the cause of this trouble, and both seedsmen and their customers will do well to take the greatest pains in procuring the very best seed that can be had. But it cannot always be traced to this cause. It is thought, with much show of reason, to result often from the same condition of soil that occasions clover sickness. Soils which yield good crops of red clover, are but little liable to "finger and toe." A too frequent repetition of the turnip crop is supposed to be one cause of this disease, just as a too frequent repetition of clovering will cause "clover sickness." Cure of the disease is out of the question. One prevention is possible, and this is to be secured by taking care to have the land in excellent condition. Liming, drainage, deep ploughing, and ample manuring, are all of them means which have been successfully adopted to prevent this evil.

Harvesting and Storing the Crop.

Owing to the length of this article, these topics must be deferred to a future number.

Treatment of Grass Lands.

There is a pretty common expression of opinion among farmers, that land once laid down will do better to be kept in grass and will continue to improve and thicken up. In England, also, it is often maintained that grass land does better not to be broken up and reseeded; that the grass upon old fields is more abundant and more nutritive than on newly seeded lands, and hence there seems to be a disposition to keep such lands in condition without breaking up, by top-dressing and other means of renovation. Let us look at it a little.

Circumstances and soils differ so much that even if it were true, here and there, that grass lands do better to remain as they are, it would hardly do to lay it down as a rule of universal application. It is probably true, that with our imperfect modes of seeding, the use of so few of the many varieties that are naturally to be found in an old field, the turf will thicken up by the growth of many grasses that come into the soil in the course of time. This will for some years continue to increase the yield, so that the field will appear to be growing better after it is laid down, especially if the soil is strong and good, or naturally suited to grass. But this increase must have its limit, even in the best of soils without the judicious application of manure. The profitable growth and constant removal of grass and hay will lead to a depletion of the soil as true as the laws of nature are fixed and immutable.

But a large portion of our soils are not especially adapted to grass. Good crops are grown upon them with constantly increasing difficulty and labor, and though the liberal application of manure may keep them productive for a time, they soon begin to "bind out," as we say. The soil will get filled up and crowded with the roots of twitch or couch grass, or other objectionable permanent growths. We see instances of this every day on our lighter and poorer soils, especially where they are not often and liberally top dressed, and this on most farms is practically impossible, or at least so difficult and expensive that it is not often done. On our drier upland knolls and plains, the droughts of summer or the formation and continuance of ice upon them in the winter, will kill out many of the better grasses, in spite of all we can do, and it would be unreasonable to expect such lands to continue to improve indefinitely. In fact, the crop will and does deteriorate in the course of time, and grows less and less.

We find, therefore, that so far from leaving such lands in permanent gaass, there is a growing inclination to subject them to some cultivation, even more frequent than was formerly practised, something that may be called the annual forage crop system, by which the whole farm, or rather all the grass land of the farm, is put under the plow as often as once in three or four years. Indeed, we know farmers, whose whole tillage land has been under the plow within three years, and who have settled down upon this as the most profitable system for them to pursue, especially since our seasons of terrible drought and our hard open winters have so seriously affected all our grass lands as to reduce their supplies for winter feeding.

The process is to plow up deeply and thoroughly early in the fall, let the land lie in the furrow till spring, put on the harrow or cultivator as often as once a week or ten days to keep down the weeds, and give it a partial fallowing, till the middle of June, and then sow on millet or Hungarian grass with a slight top dressing and roll or bush in the seed and the manure. By the tenth of August or thereabouts the crop will be fit to cut, and so far as our observation has gone, where the land is light and in fair condition, the yield has been from two to three tons to the acre of a good quality of winter forage.

The land is ready then to be ploughed up again, the turf sufficiently mellowed by frequent working to lay down to grass with another light dressing to give the seed a rapid and strong start, and if a sufficient variety of grass seed is sown the result will be a better crop of grass than it had borne for some years previously. We have known grass lands greatly improved in this way and at a little expense. The mere process of cultivating, loosening and breaking up, has been a positive benefit, while there has been no loss, but rather an increase of the winter stores of forage.

The great and prevailing error in laying down land has been insufficient seeding, or rather seeding with too limited a number of varieties of grass seed. The result is a poor, thin turf, and of course a light crop of grass. It takes too much time to wait for other grasses to come in and occupy the spaces left vacant by too light seeding with one or two varieties of grass, and before the process of breaking up often is condemned, we want to see the system of more liberal seeding with a larger number of varieties fairly tried. We are confident the results will be satisfactory.—*Mass. Ploughman.*

Growing Corn Fodder.

In growing corn fodder, our object should be to select a variety of corn containing the least woody fibre. I do not think any one has turned his attention to this point. Nearly all the advocates of corn fodder either recommend growing *sweet* corn or of sending to the south-west for seed of the large Dent variety. If they can get corn that will grow from ten to twenty feet high they think it is an advantage. I once saw a stalk grown in this State that was twenty-two feet high. I presume it was about as nutritious as a fishing-pole. What we want is a variety that produces the largest proportion of leaves and the shortest and smallest stalk. Instead of sending south for the large, late kinds of corn, we had better send north for the smallest variety we can find—and then make it grow as large as we can by high manuring and good cultivation.

Corn fodder ought to be grown on dry land. Many farmers if they have a piece of low, rich, mucky land too wet to plough in the spring, sow it to corn fodder or buckwheat because they can do nothing else with it. Occasionally they get a good crop, but as a rule they do not get corn fodder enough to pay for the labor. I advise the selection of the driest and richest and mellowest land he has. Then *drill in* the corn in rows 3 to 3½ feet apart. Three bushels of corn per acre is none too much. As soon as the corn is up go through it with a cultivator, and a few days later go through it again twice in a row. The object in going twice in a row is to run the cultivator as close as possible to the plants and thus destroy the weeds. Cultivate frequently as long as a horse can get between the rows of corn. If the land is rich enough this plan will give a large crop of green fodder. The common mistake in growing corn fodder is in sowing it broadcast. Three years ago I had three acres of warm, rich land where the clover had failed. We ploughed it up the last of May and drilled in corn, 3½ feet apart, and cultivated thoroughly. We had a splendid crop. The next year the Deacon thought he would raise some too, and he sowed a piece broadcast on low, wet land. His crop was not worth cutting. Last year he concluded he would drill in his crop, and borrowed my drill for the purpose. After he had got through his faith failed him; and he went over the piece again, drilling in another row between each of the first rows. This of course made the rows so close together and so crooked that he could not use the cultivator. Weeds and corn had to grow together, and the result was what might have been expected—not half a crop, and the land left in a foul condition.

The essential points in raising good corn fodder are: (1) Rich, warm, dry land; (2) a small, early variety; (3) sowing in drills wide enough apart to allow the use of a horse-shoe; (4) thick seeding in the rows; and (5) thorough cultivation.—*J. Harris in Am. Agriculturist.*

Beets in Rotation of Crops.

It is improvident, and bad farming to cultivate the beet root two or more years in succession on the same piece of land. Dr. Voelcker, says that on the continent, beet is always looked upon as a fallow crop. There are various modes of growing it in different countries, dependent on the soil, the climate, and the requirements of the markets, but in all cases it is considered good farming to let it both follow and precede a corn crop. Beet succeeds best after winter wheat, well dunged. Clover or seeds, on the contrary, should not precede beets, for although the roots grow to a large size and yield well after clover seeds, they remain poor in sugar and take up too much saline matter from the decomposing vegetable remains of the preceding crop. Beets are usually followed on the continent by spring wheat. On land peculiarly well suited for roots, two or three crops of beets are sometimes taken in succession. In this case however, it is necessary to apply farm-yard or artificial manure to the second and third crops.

The following examples of rotations can be recommended:—

I.
1st year.....Beets, manured.
2d " .....Barley or Oats.
3d " .....Clover or Sainfoin.
4th " .....Wheat.
5th " .....Beets, manured.

II.
1st year.....Beets, manured.
2d " .....Wheat.
3d " .....Clover.
4th " .....Rye or Oats.
5th " .....Beets, manured.

III.
1st year.....Potatoes, well manured.
2d " .....Beets, not manured.
3d " .....Wheat.
4th " .....Clover, hay, or some forage crop.
5th " .....Potatoes, manured.

Mr. Baruchuson, says that beet as an alternate crop is eminently suited to wheat, flax and turnips, all of which are then more abundant. That this is especially so with wheat is agreed by all who have made the experiment.—*Ex.*

Sainfoin and Lupins.

This leads us to the consideration of Sainfoin. Of this there are now established two well-known varieties - the common sainfoin, *Onobrychis sativa*, and the giant or double-cut sainfoin, *O. sativa var. bifera*. The former of these is the most persistent, and the more valuable as a pasturage or soiling plant; but the latter yields an enormous crop of hay, and as we have experienced, may be cut twice a year for two years. Our first cut of this, the year before last, was so thick on the ground as to be almost unmanageable, and the second was a good crop; the fact that it yielded two good crops, though not quite so large, the year before, speaks well for it as a heavy cropper. It is, however, rather coarse and stemmy, but, even so, when cut into chaff we find all animals do uncommonly well upon it.

Lupins will be known as garden flowers; they may have blue or yellow flowers. We have grown both, and consider the blue-flowered the larger plant. We know from experience that they will grow in very poor soils; but, as indeed they depend more upon climate than soil, they are apt to be disappointing. We remember one year growing them beautifully—we think in 1855—but, whatever the date, the next year they utterly failed, though under the same conditions. The fact is, the first season was a warm one, the next an exceedingly wet one. We expect that this crop would have been a failure for the past two summers; but we hope this year to try a field patch, drilled at the rate of two bushels an acre. In our uncertain springs it would be unwise to sow them early, as then the young plant may be injured with frost; and if they are meant to seed, it is next to impossible to get the beans ripened in time to harvest. Our object in trying them will be to use them cut up like green bean stalks; and if it be true that they will grow a tolerable crop on poor lands, we expect to make it answer our purpose.—*Professor Buchman in the London Field.*

Horticulture.

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

THE ORCHARD.

Cultivation of Young Orchards.

Having planted the trees according to the directions and diagram given in Number VIII of CANADA FARMER, the cultivation of the trees will demand attention. It is a very common and a very reprehensible practice to pay no attention whatever to the cultivation of the orchard as such. The trees having been planted, they are expected to grow without any further concern, and the whole attention is turned to getting a crop of some kind from the ground now occupied by the trees. If the field has not been already sown with fall wheat or rye, some kind of spring grain is put in, and the trees left to battle with the heat and drouth of summer, while millions of little pumps are set to work, pumping up the moisture from the soil, and dissipating it in such a way that the tree-roots are left without a drop. If the directions with regard to *mulching* each tree, given in Number VIII, have been heeded, this mulch will do something in the way of saving the trees from the injurious effects of a crop of grain, but besides this the planter should not allow any grain to grow within two feet of any tree. During the first season after planting, this injunction is of the greatest importance; the vigor, health, and often the life of the trees will depend upon its observance. Remember that the trees are now a part of the crop which the ground is to support, and should have their share of room and attention. It would be much better to cultivate the ground to some hoed crop, for the three years immediately after planting, than to sow with grain. By no means allow your young orchard to be seeded down to grass. When it is desired to check the growth of the trees, then will be the time to have it seeded down. Meanwhile cultivate, if possible, with potatoes, white beans, turnips, or even Indian corn, so long as the ground is kept well stirred and well manured.

Every spring, it will be necessary to go through the orchard from tree to tree, and cut out such shoots as are crowding into the centre of the top, interlacing, crossing and interfering with each other. A little attention every season is much better than three or four years of neglect, followed by a fit of cutting and slashing, termed pruning. There is no part of the care which an orchard requires that makes such demands upon the good sense and judgment of the cultivator as the pruning. Each branch should have its share of light and air, and should be so pruned that the most of its leaves can be exposed to the sun, while at the same time no part of the limbs themselves should be exposed to the direct action of the sun's rays. Unless the foliage can have the full benefit of sun and air, the fruit will be poorly colored, and of poor flavor. And yet as important as the pruning is, it is almost impossible to give rules for doing it which will be of much assistance. In this matter of pruning, the cultivator must use his own brains, and not depend on the brains of other people.

Yet there are a few hints that can be given which will be of some use in guiding the inexperienced, and helping them to start in the right direction. In the first place the pruning should not be done in the fall, in our climate, nor during the winter, while there is probability of experiencing severe freezing weather. Experience has shown us that the wounds made by pruning at such a time do not heal over readily, but become sources of permanent injury, decay and death. Either prune early in the spring after the severe freezing weather is past, or late in the spring after the leaves have begun to expand. If large branches are cut away when the sap is ascending in full force, it is apt to issue from the wound in such quantity as to prevent the cut from healing over. Wounds will heal over most rapidly when the tree is in full growth towards the end of June or beginning of July.

Again we should do our pruning when the branches are small, so as to prevent as far as possible the necessity of cutting off large branches and thereby making severe wounds. It is a good plan, when it is seen that the removal of a large branch has become necessary, to remove a part at a time. We have for many years practised this method and can recommend it fully. By leaving a part, say one-third of the branch, the remainder of the tree will grow much faster than the mutilated limb, so that relatively it becomes much smaller next year than it was this. At the next pruning half of what was left is taken away, and the remaining portion by the more rapid growth of the other parts off the tree becomes comparatively quite small, so that when at next pruning the branch is taken of close to the trunk, the wound made is so small in comparison with the size and vigor of the tree that it soon heals entirely over, usually in a single season. If however the branch had been cut off close to the trunk in the first place, the wound would have been so large that it would have required several seasons to heal over.

A branch or twig should never be cut off unless there be a good reason for removing it. Some persons act as though it was necessary that the tree should be pruned at all hazards. They go at it with knife and saw, and without any reason for taking off one branch or shoot rather than another do a certain amount of cutting and call it pruning. The object of of pruning is to form a symmetrical and well balanced head, and to give to every part of the top its due measure of light and air. If none of these purposes is to be served better by the removal of the branch, than by leaving it, it certainly should be allowed to remain.

Study the natural habit of the tree. Some varieties, of apple for instance, have a very upright and somewhat fastigiate habit of growth. Others are inclined to spread and form a rounded head. Others droop too much. To meet all the requirements of these various habits, and to so prune each tree that its peculiarities of growth shall be skilfully mastered and counteracted, or employed so as to form a perfect tree of its kind, is the work of the thoughtful orchardist. How to do this cannot be taught by set rules, but he who learns must be his own teacher.

Cost of a Fruit Farm in New Jersey.

Some readers might like to know what outlay it would require to start a small fruit farm. If so, I can give them some figures which may be of service. A man engaged in general farming as his main business should not attempt much in the fruit line unless he has plenty of capital, and also the requisite tact and energy for pushing both branches. He will find that they interfere with each other, and the demands of fruit are inexorable. When strawberries, for instance, are ripe, they must be marketed, no matter how many tons of clover are ready to be cut. The reverse is also true; if fruit-growing is your main interest, do not suppose that you can easily attend to farm crops at the same time. They *will* interfere more or less, and the man who attempts this sort of mixed farming must be prepared for extra expense and extra care to conduct both successfully.

Ten acres in fruit, so divided that a succession of crops will follow all through the season, will furnish regular employment to at least three grown persons, and if several children can be added for the lighter work of pulling runners, "snipping" raspberry and blackberry canes, picking up stung fruit, assisting in curculio hunting, &c., so much the better. Fruit-growing has no lack of work. During the marketing season of the small fruits and grapes, of course a large extra force of pickers is needed; peaches, pears, quinces or apples on such a farm can generally be marketed by the regular force.

A man with moderate energy, with all the capital that he needed, would find that a farm of 15 acres would answer him very nicely. He could then put 10½ acres in fruit, (divided as below,) have plenty of space for ornamental grounds about his buildings, and use 2½ or 3 acres for raising clover, fodder corn, vegetables, &c., for family use, and for his horse, cow and pig. The proportion of land for the various sorts of fruit which succeed well here, with the distances to plant, and a close approximation to the cost, are indicated as follows:—

1½ acres Strawberries, 3 feet by 18 inches, 14,520 plants, at $2.50 per 1,000.	$36.30
½ acre Raspberries, 8 by 3 feet, 907 plants, at $15 per 1,000.	13 60
1½ acres Blackberries, 9 by 4 feet, 2,420 plants, at $15 per 1,000.	36.30
1 acre Peaches, 18 by 18 feet, 134 trees, at 9c each	12.06
3 acres Grapes, 12 by 10 feet, 1,089 plants, at $30 per 1000.	32.67
3 acres 1 year old standard Pears, 10 by 10 feet, 510 trees, at 25 cents each.	127.50
Total.	$258.43

The nursery stock thus needed for 10½ acres would cost less than $26 per acre. Ploughing would cost (hired) about $4 per day; wages for laborers to assist in planting, $1.50, without board. What the total expense for planting would be I cannot say—it would depend very much on the proprietor's tact for getting work done rapidly and well. The largest item of labor connected with this estimate would be for digging holes for 644 pear and peach trees, but it can be done rapidly in our genial soil.

I have assigned only half an acre to raspberries, because they have steadily decreased in profitableness for three or four years past, and though mine were fine in 1872, they did not pay nearly as well as strawberries. Blackberries have their seasons of depression, but do fairly on the average. A neighbor of mine sold $622 worth from two acres last season; and from one acre I sold $248 worth (freight and commission out) the same season, and with no manuring for several years, though they were well cultivated. Strawberries are about as reliable as any crop I can raise, taking the average of a series of years; last year less than 1,100 quarts returned me about $188. Grapes did not do as well last year as in 1871—cause, thrips, rot, low prices, and an unusual tenderness of the skin, which caused many to spoil on the way to market. They had more competition with peaches, also, the latter ripening later than in 1871, and grapes earlier.

Nursery stock generally—pears excepted—costs much less now than when I began here in 1866, while the prices for fruit average about the same; hence a person desiring to go into fruit culture now will have some important advantages over the rest of us who paid full prices. The advantage of our experience with worthless and unsuitable varieties, will also be worth some dollars per acre to a man who makes it a point to inquire into such matters.—*Cor. Coun. Gent.*

Ploughing in the Orchard.

The best way to plough the orchard is to either begin or finish a land at a row of trees. There is no *meaner* way than to commence a land so as to turn the furrow away on one side of the tree and toward it on the other. It is the easiest way to begin at a row and turn the furrow toward it from both sides; but to do so every year would soon ridge the field too much. I usually plough toward the trees two years, and one year away. By doing all the dragging directly across the land, or diagonally, the field will remain quite level. Of course, the ploughing should be done very shallow, especially as far as the roots extend.

There are whiffle-trees made to use in the orchard, which I have no doubt are a good thing, although I have never used them, but the bark on young trees is very tender and is easily broken. If the harness loops on the traces, or any part of the harness comes in contact with the tree, it is very likely to make a wound. I think it pays to have a smart boy (a man will do as well, if he is smart enough) to keep along beside the team and bend the tree away and lift the trace and whiffle tree if necessary, so as to pass clear. By having such help, to plough two furrows on each side of a row of trees, the ploughing can be done nearly as fast as if there was no trees in the field. When marking for planting, the ground should be spaced off so as to have a row of corn in the rows of trees, both ways. As the trees increase in size, I think it is well to plant the first row a little farther from the trees. My trees are just thirty feet apart each way. At first I divided the space equally, and planted the corn three feet nine inches; now I mark the first row four feet six inches and the balance three feet six inches.—*Exchange.*

Horticultural Buildings.

We present to our readers, on this page, illustrations of a span-roof plant house and a lean-to vinery, constructed on principles most popular at present in England, and for which high merit is claimed. The inventors of these plans are the Messrs. Richardson, a well-known English firm, and they have secured English patents for their improvements on the old style of construction. The London *Country Gentleman's Magazine* speaks very strongly in praise of buildings erected on these plans. As the science of horticulture advances from day to day, says our cotemporary, so, as a natural consequence, must the proper construction and ventilation of buildings connected therewith; and as some of our readers may be unacquainted with some of the latest improvements therein, we notice Messrs. Richardson's Patent Horticultural Buildings, on account of the general satisfaction expressed by many of our correspondents who have ordered them. We have seen them put up, and have to express our unqualified approbation of them as being desirable and elegant even in the simplicity of their details. What is of greater consequence, however, the builders have recognized and provided for ventilation upon truly scientific principles. They shape their details in such a way as to admit the outer air, not above nor below, but opposite the heating medium and, moreover, have abandoned the system of what might be called trap-door ventilation in the apex of the roof, and taken to the wiser and more complete and uniform method of distributing it regularly over the sloping roof from top to bottom. This advantage is so manifest, even to those who have not gone into the subject, that scarcely another word need be added in its praise. It will be seen abundantly illustrated in figs. 1 and 2. Fig. 1 shows the roof ventilated in two lengths so that a greater or less volume may be introduced as necessity demands. It is more useful for lean to houses with a long sloping sash than for the ordinary description of span-roof houses; and it is well that the patentees have recognized the principle, and provided for it accordingly with their ventilating apparatus. In these engravings the roof ventilation is fitted to prevent heavy rains from coming down upon the plants or the fruits within, and the mechanical contrivance for simultaneously raising or lowering the parallel slips is as simple as it is effective. Either one, two, or more can be thrown out of gearing, and the others working; or it can be divided up the middle in the same way or not, as the gardener may desire. The same principle is equally applicable to a lean-to peach house, as is shown at fig. 3, or to a cucumber, or melon, or pine pit, as is shown at fig. 4. It is illustrated on a much larger scale at fig. 5, where there is shewn a horizontal section through one of the ventilating roof-lights, and where the ventilator is shewn both shut and open.

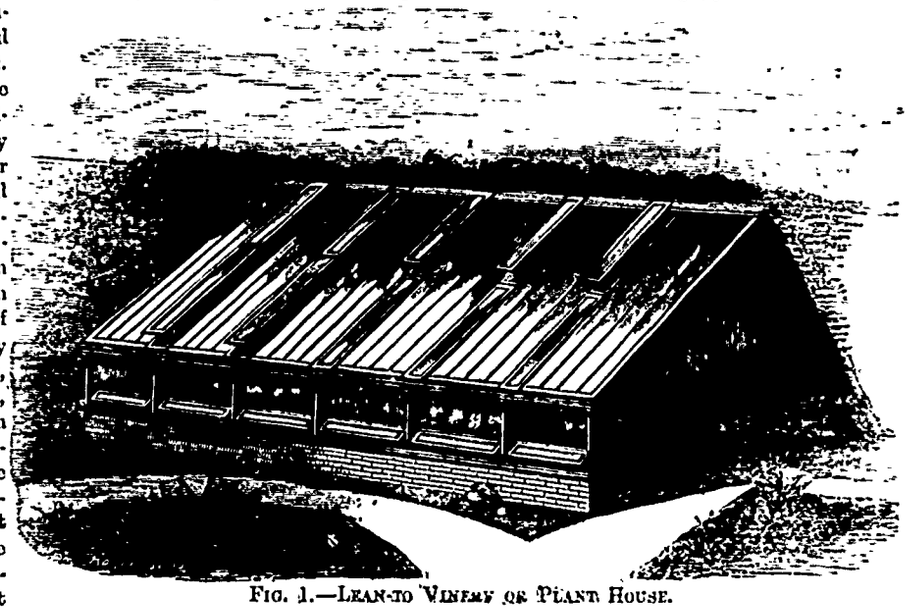


Fig. 1.—Lean-to Vinery or Plant House.

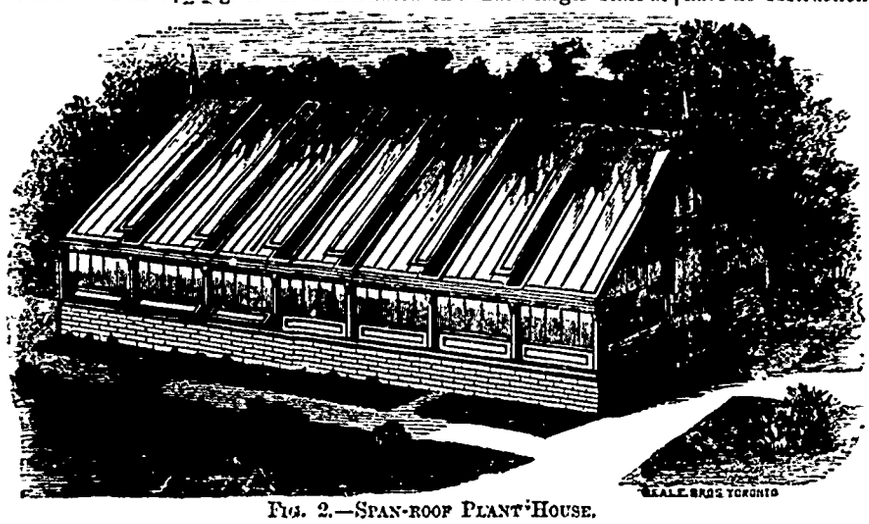


Fig. 2.—Span-roof Plant House.

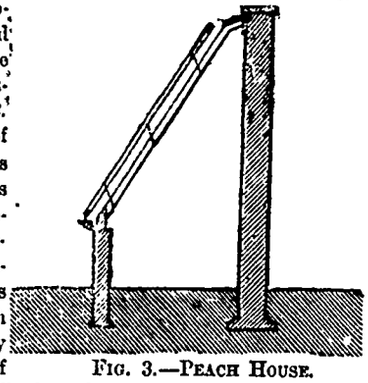


Fig. 3.—Peach House.

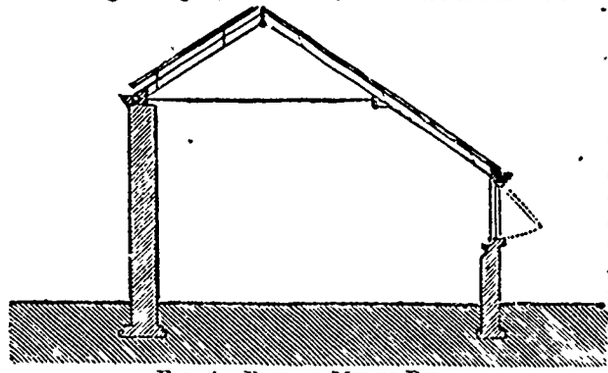


Fig. 4.—Pine or Melon Pit.

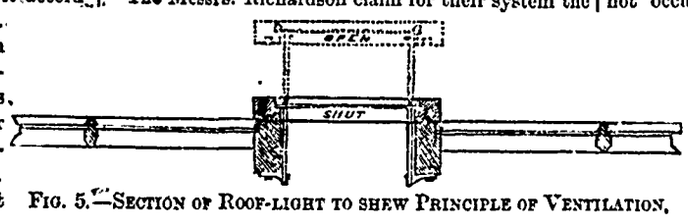


Fig. 5.—Section of Roof-light to shew Principle of Ventilation.

The Messrs. Richardson claim for their system the following special advantages, which they think cannot be found to an equal extent under any other system:—1st. The amount of roof ventilation is exactly in proportion to the area of the house, instead of being by the ordinary size opening along the top, made regardless of the width of roof. 2nd. The ventilation is not affected by rain or wind, the position of the ventilating lights completely protecting the interior of the house, and when closed forming a perfect water-tight joint. 3rd. The opening and regulating of the ventilators is performed more quickly and easily than by any other system, being done instantaneously. 4th. The method of bottom ventilation underneath the plant staging, and immediately over the hot water pipes prevents cold draughts upon the plants. 5th. The houses are portable and legally removable by a tenant, can be taken down easily and re-fixed without disturbing the glass. 6th. The training wires, being fixed up the centre of the lights, have no obstruction from the sun's rays by the usual heavy rafters, and a free circulation of air is obtained between the plants and the glass over the whole roof. 7th. If blinds are used, they are lifted simultaneously with the ventilators, thus allowing a circulation of air underneath, instead of obstructing the ventilation just when most needed.

Dutch Bulbs after Flowering.

A very general impression prevails that the beautiful flowers of hyacinths, tulips, and other things which we flower in our rooms, are but once for all visitors; and that after they fade we may as well throw them unceremoniously out of doors. That there is some secret or trade-plan of growing them in Holland so as to make them produce very fine flowers on their first blooming with us seems certain, but as a general thing they will do tolerably well if taken a little care of, after we have done with them inside. The plan of growing them in water is a very interesting way. They do not need the daily attention which pot-flowers do; and besides we can place them in positions which clumsy pots cannot occupy. But the bulbs grown in water are more exhausted than those grown in soil, and no doubt much of the prevalent idea of the worthlessness of old Dutch bulbs comes from experience with these; but even these, if planted out in the ground as soon as possible after the housekeeper has done with them, will make a little flower next year. Those which have been raised in

earth, however, will produce quite as good yield of flowers next season; not quite as good to be sure as when first imported from Europe, but still good enough to satisfy people of moderate aspirations, as most country folks are.

We pen these remarks just now through knowing several country gardens within a mile or so of our office, where there are beds of hyacinths, tulips, crocuses, and other such bulbs, which have been growing in the same place years enough to entitle them to the name of American bulbs, which come up and flower year after year almost as well as if freshly imported. The tasteful farmers' wives who attend them, have a layer of good manure put over them every fall, and it seems to do them nearly as much good as the native mud of the dyke lands of Holland. In the spring other flowers are set in among the roots and come on as the spring flowers die away. By no means throw out the exhausted window-bloomer.

The China Primrose.

This old established favorite, *Primula Sinensis* is perhaps the most ornamental and charming, as it undoubtedly is the most useful, of all our winter and spring decorative plants. In the "Old Country," it is considered of the utmost importance by those upon whom large demands are made for the decoration of rooms and conservatories, during the winter and early spring months; and consequently receives that degree of culture and attention which it so well merits. Now if it is found to be so serviceable in England, how much more so should it be in Canada, where we have such long dreary winters, and so few really good things that succeed even tolerably well, owing to the amount of fire heat we are obliged to employ, this very same dry heat being one of the great essentials to success—damp being their greatest enemy But among our Canadian gardeners, and amateurs generally, it appears to be either altogether overlooked, or its habits and requirements but imperfectly understood: even in prints devoted to Horticulture, we rarely find even a paragraph devoted to this charming plant, while whole pages are engrossed by others which do not possess a fraction of its merits.

To those who are in the habit of growing a few plants annually, I would say, if they are worth growing at all, they are worth growing well; if you cannot afford the time and attention requisite for their successful cultivation, do not attempt it at all Better a hundred times over, to discard them altogether, than produce the miserable specimens we are only too often accustomed to meet with, and which are simply a disgrace to those connected with them The difference between a liberally cultivated *Primula*, and a starved neglected one, is much about the same as that presented by one of the family of the great unwashed, making his bow to the "beak" after a night's reflection in the gutter or police station, and paterfamilias presenting himself at the breakfast table, sleek and rosy, after a comfortable night's sleep and a refreshing plunge in the bath room

To those who have not grown it, and who yet feel the want of a really good table or window plant, during our long dreary winter months, I can most unhesitatingly recommend it; and for bouquets, or baskets of cut flowers, to my mind, there are few things equal to the double and semi-double varieties

The time to sow the seeds must of course be determined by the time the plants are required to bloom A good plan is to make a sowing in April, and another in August (the interval generally proves too hot) Plants from the former sowing will begin to bloom in October, while those from the latter will not flower before February I find however, no difficulty—by keeping the surface of the soil in the pots stirred, and giving occasional waterings with weak liquid manure—in keeping them blooming from October till May, after which time the weather is too hot for them.

It is of the utmost importance that only seed of the very best strains be sown; plants from the purest and choicest strains, cost no more to raise than do those from the poorest and most degenerate; while the difference when in bloom is pretty much the same as between other well and ill conditioned objects, whether animal or vegetable.

The soil employed for sowing the seeds on should consist principally of well rotted leaf mould, or thoroughly decomposed hops, with a large proportion of clean, sharp sand. It is perhaps as well to cover the seeds very slightly, then place them where they will have a temperature not lower than 59°. The plan I follow myself, is to sow on the surface of the soil, tie a piece of paper over the pot or box, and when water is required, merely to sprinkle the paper. I find more seeds will germinate by this method than any other; but it requires the most watchful attention, as, after the seeds begin to swell, should they once be allowed to become dry, their germinating powers are completely destroyed.

As soon as the seedlings have made their first rough leaf, they should be carefully pricked off into shallow boxes or pans, kept close for a few days, until fresh roots have been formed, when they should be gradually inured to a free current of air, night and day, if weather permits As soon as they begin to get crowded, either at root or top, they should be potted into small pots, and receive the same treatment as when pricked out Their after management consists in shifting into larger pots, as those they occupy become filled with roots; shading from the strong midday sun; careful watering at the roots, and a sprinkling overhead on the evenings of bright days.

POTS.—The size of pots which I find most convenient for blooming them in, is the six-inch, or quart pot, but larger or smaller may be used, according to the purpose for which the plants are designed. A few small pieces of broken pots, or charred wood, should be placed in the bottom to insure perfect drainage, for—although when growing freely, and in bloom, they require to be watered copiously—they are peculiarly susceptible of stagnant moisture, which causes them to "damp off" at the collar. Owing to this tendency, care should be taken when potting, not to place the neck of the plant too low in the pot.

SOIL The Primula seems to delight in a light and porous soil, particularly in the earlier stages of their growth. But, although luxuriating in a compost consisting mainly of leaf mould, they will not bloom so freely, nor will the individual flowers be so large as if they were grown in soil of a heavier nature. It is therefore advisable to use less leaf mould and more loam at each successive potting, until, at the final one, it may consist of one part leaf mould, to three of good turfy loam, with a sprinkling of clean sharp sand If an occasional watering of liquid manure cannot be given, a quantity of well decomposed manure may be added with advantage.

INSECTS.—If the plants have been maltreated, or grown amongst plants which have had insects on them, green fly, red spider, and even mealy bug will attack them; but if grown by themselves—which, where possible they should be—and receive ordinary attention, they will remain as free from these pests as a scarlet geranium.

TEMPERATURE.—From the moment the seed is sown, until the plants commence flowering, the temperature should not fall below 50° After the flowers expand, the cooler they are kept, the longer will they remain in bloom. Of course care must be taken that frost does not reach them.

With our hot burning sun in summer, the great difficulty is to keep them cool A position in which the sun's rays will be shut off them from 10 A. M. until 4 P. M., will suit them admirably; when this cannot be had, shading must be resorted to, up till the middle of September, after which time they will bear all the force of the sun's rays.—JOHN M. BOTHWELL.

Roses.

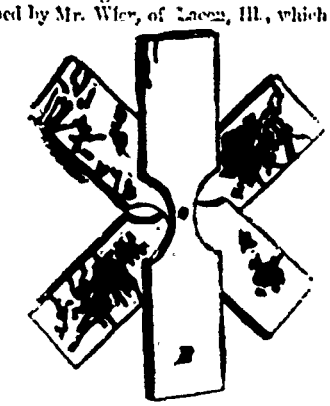
The Rev S Reynolds Stole, than whom there is no better judge nor more devoted admirer of the Rose, says that for cultivation underglass, *Souvenir d'un Ami* with its broad blushing petals and lustrous leaves, and Marechal Niel, in its golden beauty, symmetrical form and exquisite fragrance, are specially and invariably beautiful.

Entomological Department.

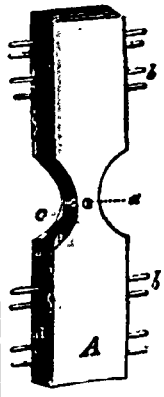
The Codling Worm.

Few, if any, insects cause the fruit grower a greater annual loss than the Codling-worm, or Apple-worm, as it is often termed (*Carpocapsa Pomonella* Linn.); and few insects have, perhaps, had more experiments tried upon them for their extermination than this destructive pest. Much may always be done by gathering up the fallen fruit every year and feeding it to pigs, but as this is a remedy that saves the future, not the present crop, it savours much of "locking the stable-door after the steed is stolen."

To protect the apple crop in the first instance, bandages of various kinds to surround the trunks of the trees have been recommended time and again. Last year we brought before our readers a new device, designed by Mr. Wier, of Lacon, Ill., which is now



usually recognized as the "Wier trap." We reproduce our illustration for the benefit of those of our readers who may not have the CANADA FARMER for 1872 at hand to refer to. Fig. A. represents the trap closed; B. the same open.



It consists of two or more thin pieces of board, 12 to 20 inches in length, and 2 to 4 in width, with a screw *a* through their centre. The screw must be long enough to be firmly driven into the trunk of the tree. The object of the trap is to provide a place of shelter for the worms, where they can be easily found and destroyed.

Our friend Prof. Riley, State Entomologist of Missouri, has been recently making experiments with this invention and other remedies, and thus recounts the results, in the May number of the *American Agriculturist*!

"Resolved to test Wier's trap thoroughly, in comparison with other methods of allurement, I commenced as early as the first of May to prepare a number of trees as follows: 1st, with Wier's trap, screwed on in different positions; some trees having single traps, either on the north, south, east, or west sides, and placed at different heights from the ground, and some having as many as three traps; 2d, strips of old sacks four inches wide, and lined on one side with pieces of lath tacked on transversely, and at such distances from each other that when brought around the tree they formed an almost complete wooden ring; 3d, bandages of various kinds of rag; 4th, hay ropes; 5th, paper bandages, made of the cheapest kind of straw-paper, folded several times, and in widths varying from three to six inches, In order to insure the utmost accuracy, these several traps were regularly examined every twelve days throughout the season, and a careful account kept of the worms or chrysalids found under each; and where it was a

question as to the comparative merits of the different traps they were placed on trees of the same variety. The results of these experiments not to waste space with the detailed array of figures may be thus summed up:

No Apple-worms were found until the 14th of June, and though many other insects had previously taken advantage of the shelter, *not a single Plum-Curculio was found.* While, therefore, there is no harm in having the bandages on as early as recommended last year, in ordinary seasons little, if anything, will be lost by waiting until the first of June. Where three of the Wier-traps were on the same tree, I obtained more worms than where there was but one; and where there was but one there was no difference in favor of position as regards direction or altitude, taking the season through. The lathed canvas encircling the tree secured, on an average, five times as many worms as any single Wier-trap. The rag, paper, and hay bandages allured almost as many, and either kind more than the single Wier-trap.

I hope therefore that the patentees have already realized the anticipated fortune from their invention; for, while I should be sorry to injure their chances in the least, truth compels me to state that, after a year's trial, I am not quite as favorably impressed with the usefulness of this shingle-trap as I was before trial, and am more thoroughly confirmed in the opinion expressed last year that, "notwithstanding all the theories of my friend Wier, it must always be inferior to any trap that encircles the tree." I do not wish to detract from its merits one jot, and where old shingles are abundant, and other material scarce, the former will still prove valuable for the reasons given a year ago, and Mr. Wier deserves our thanks for showing us how to use them.

Time, expense, and efficiency considered—and so far as one year's comparison will warrant conclusions—I place the different materials enumerated in the following order of merit:

1st. Paper bandages. Common straw wrapping-paper, 18 x 30, can be bought for 60 cts. per bundle. Each bundle contains 240 sheets, and each sheet, folded lengthwise thrice upon itself, will give us eight layers between two and three inches wide, and be of sufficient length to encircle most ordinary trees. It is easily drawn around the tree and fastened with a tack; and so cheap, that when the time comes to destroy the worms, the bandages containing them may be detached, piled in a heap and burned, and new ones attached in their places If eight bandages are used to each tree during the season, the cost will be just two cents per tree, and the owner could well afford to treble the number of sheets, and keep three on each tree, either together or in different places.

2d. Rags. These have very much the same effect as paper, but are more costly, and difficult to get of the requisite length. Where they can be had cheaply, they may be detached from the tree and scalded with their contents.

3d. The Wier-trap used as recommended last year is perhaps the next most useful; but both cost and time required to destroy the worms are greater than in the first two methods.

4th. The lath belt is the very best of all traps so far as efficiency goes, but it is placed fourth on the list because of the greater cost and trouble of making. On the same kinds of trees (early harvest), and in the same orchard, I have taken with this belt, between June 15th and July 1st, as many as 68 and 99 larvæ and pupæ, against fourteen and twenty in the single Wier-trap.

5th. Hay-bands, on account of their greater inconvenience, I place last.

All these methods are good, and the orchardist will be guided in his choice by individual circumstances.

I wish to allude before closing to an apparently plausible theory advanced by Dr. J. S. Parker, of Ithaca, N. Y. In an article in the *Maine Farmer* for June 1st, 1872, in which nine-tenths of all the apples set in 1871 are said to have been either totally lost or greatly damaged, he suggests that the insect might be well nigh exterminated if, by united effort, we could forego one year's crop by knocking off all the young fruit. He fails to attach sufficient importance to the fact that the insect breeds in wild crabs, pears, peaches, and even plums."

In conclusion, we would remind our fruit-growers and the public generally, that *now is the time* to apply these remedies to their apple-trees if they wish to save this year's crop.

One Worm did it.

One day I was walking with some friends through Sudbrook Park, in Surrey, when Dr. Ellis drew our attention to a large sycamore tree, decayed to the core.

"That fine tree," said he, was killed by a single worm."

In answer to our inquiries, we found that about two years previously the tree was as healthy as any in the park, when a wood-worm, about three inches long was observed to be forcing its way under the bark of the trunk. It then caught the eye of a naturalist who was staying here, and he remarked, "Let the worm alone and it will kill the tree." This seemed improbable; but it was agreed that the black-hearted worm should not be disturbed. After a time it was discovered that the worm had tunnelled his way a considerable distance under the bark. The next summer the leaves of the tree dropped off very early, and in the succeeding year it was a dead, rotten thing, and the hole made by the worm might be seen in the very heart of the once noble trunk.

PROTECTION AGAINST CUT WORMS.—The *Mobile Register* says:—A thousand and one remedies for cut worms are published in agricultural papers from time to time, few of which are at all worthy of consideration. We know of but two that we could recommend. A thin layer of pine saw-dust spread around the base of the plant will generally protect it, and in setting out plants, as cabbage and the like, nothing equals a leaf wrapped around the stalk. That will never fail. Roll any kind of leaf convenient around the stalk and set it into the ground with the plant. It will dry and become hard in a day, and then no cut worm will trouble it; and when the plant has grown sufficiently large to burst off the leaf it will be out of danger.

Agricultural Chemistry.

Plants.

In various parts of India, and other hot, dry countries, the ground is periodically covered with a white saline incrustation resembling hoar frost. This substance is carefully scraped off the mud where it is found, and dissolved in water. The solution so obtained is concentrated by heat until it deposits a crystalline residue which constitutes the crude saltpetre of commerce, consisting of impure nitrate of potash. In our own climate, a similar incrustation is sometimes seen, on a small scale, on the mortar of walls, particularly near the ground. It is called "*Saltpetre rot.*"

During the wars of the early part of this century, the great difficulty of obtaining saltpetre from abroad led the government to offer a prize for the best treatise on a method of producing artificially, and at home, this substance, which, as an essential ingredient in the composition of gunpowder, is so indispensable to a nation engaged in warfare. The plan selected from among a great number submitted to the authorities to compete for the prize was the following, which was immediately put into execution and carried out with great success, and with a few unimportant modifications, is still sometimes followed. Upon a floor of impermeable clay, a heap of animal and vegetable refuse, such as old leather, hoofs, horns, straw, decaying leaves and weeds, mixed with mortar, lime and ashes, is built with one side perpendicular and the other cut into steps. It is covered with a roof to protect it from the rain, but the sides are freely exposed to the air. It is watered, from time to time, with the drainings of the stable. After a time the perpendicular side becomes covered with a white inflorescence, which consists chiefly of the nitrates of lime and potash. By dissolving this in water and boiling with carbonate of potash. The nitrate of lime is decomposed and nitrate of potash is obtained.

Several explanations of this process have been given. The one most generally received is, that the ammonia which is always given off during the decomposition of animal and vegetable substances, absorbs oxygen from the atmosphere and is converted into nitric acid, which unites with the lime to form nitrate of lime. This oxidation only takes place in the presence of lime, potash or some other strong base. It is a similar change taking place in the soil, that produces the natural nitre in the East Indies. Now these changes are going on to a greater or less extent in all soils which contain decaying organic matter, as almost all soils do, and hence all soils contain nitrates in larger or smaller quantities.

Nitrogen is essential to the growth of plants. It is the most active portion of the plant that contains the greatest quantity of this element. The contents of the young vitally active cell are particularly rich in it. All the changes which lead to the growth and development of the plant, are begun by a substance which contains nitrogen. The young sprouts of barley contain 32 per cent. of nitrogenous matter, more than twice the amount contained in the grain; and young seeds frequently contain twice as much nitrogen as they do when fully ripe.

Nitrogen exists in the atmosphere, compounds containing it are present in the organic matter that is found in the soil. These substances give off ammonia by their decay, and this ammonia, in the presence of bases, produces nitric acid, as we have already seen. From some or all of these sources plants derive their nitrogen. Probably they do not obtain any appreciable quantity directly from the air, but absorb it in some form or other by their roots.

In all probability plants absorb some nitrogen from the soil in the form of organic matter, derived from decaying plants or animals. The mistletoe lives by absorbing the juices of the plants upon which it grows and appropriating them to its own use, and we know of no reason why other plants should not similarly absorb and appropriate the organic compounds, which abound in the soil that surrounds their roots. This is perhaps one way in which animal manures prove beneficial. But probably the principal part of the nitrogen is taken up by the plant in the form of ammonia or nitric acid. Hence we see the great importance of the formation of ammonia and nitrates in the soil in the manner that we have already described. Some excellent experimenters are of opinion that animal manures act only in this way. By decomposition they yield ammonia, some of this ammonia is oxidized to nitric acid, and the nitrates of potash, &c., so produced yield to plants the greater part of the nitrogen which they contain.

Nitrogen, then, is supplied to plants by the decomposition of organic matter in the soil. This organic matter is almost invariably present. Every leaf that falls, every worm, every insect that dies adds to the stock, and in the course of ages, in localities where vegetation is luxuriant, the soil for a considerable depth is composed of little else than the remains of former generations of plants. The quantity, of course, varies greatly in different soils. Where deficient, organic matters may be advantageously added. Seaweed, sawdust, fish-bones and blood, all act in this way. They are beneficial in other ways, as well, as we shall see hereafter; but one way in which they act is by increasing the amount of organic matter in the soil, and by their decomposition yielding ammonia and nitric acid.

In some countries insects are employed as a manure. Large quantities of a kind of fly are collected by the peasants, and applied to the land. The myriads of insects of all kinds that fill the air of hot climates, and, after a brief life, die and decay, saturate the soil with their remains. Even in our own climate the amount of animal matter which is imparted to the soil by this means alone, must be immense. The earth is, in fact, a vast burying ground, every nook and corner of which is crowded with the graves of the creatures that once lived upon it, and which slowly resolving themselves into the elements from which they were derived, afford nourishment to the vegetation which covers its surface, and which, like church-yard grass, grows rank and green by their decay.

Animals, when they decay give up carbonic acid, water and ammonia—the very substances that form the food of plants. But whence did they obtain these substances? Where did they get the carbon, hydrogen, oxygen and nitrogen of which their frames were built up? In every instance, *either directly or indirectly from plants.* Many animals feed on plants, others feed on these animals. In either case it is from plants that they obtain the organic compounds that make up their tissues. Nature works in a great circle. Plants take carbonic acid, water and ammonia from the soil and the air. They become the food of animals. Animals die and yield in decaying carbonic acid, water and ammonia.

It has been said that the nitrogen is almost all taken up by the plants in the form of *nitrates* which are formed by the oxidation of ammonia. It has also been said that this oxidation only goes on in the presence of a powerful base, such as potash or lime. It will be seen from this that lime plays a most important part as a constituent of the soil. It will also be clear, that where a soil is deficient in lime, the addition of this substance to the soil as a manure will have a most beneficial effect, on its fertility—not by being absorbed and constituting plant-food itself, but by assisting in the formation of the nitrates which play such an important part in vegetation.

Correspondence.

Agricultural Exhibitions.

(To the Editor of the CANADA FARMER.)

SIR,—It cannot fail to have struck any one at all conversant with the practical working of Agricultural Exhibitions, that there are several matters in the management (especially in the case of the more extensive Exhibitions,) that require amendment, to ensure that satisfaction and success it is so desirable to attain.

For example, the question of judges and their awards is one that almost invariably leaves a legacy of trouble and unpleasantness after the holding of almost every exhibition. We fully recognize that the proper selection of judges is a matter attended with grave difficulties, and affords many directorates anxious care and thoughtful consideration, to accomplish as satisfactorily as possible to all concerned. And yet when intelligent skilled men, as judges in their respective departments, have really been obtained, how frequently do they mar their own best efforts and entail endless difficulty and unpleasantness upon the officials of the exhibition by acts of unfortunate carelessness, principally confined, however, to a neglect to make the entry in their books (necessarily the only official guide in the distribution of the prize money,) correspond with the name and prize on the card attached to the animal or article respectively. In consequence, litigation, threatened or actual, has not unfrequently been the result, besides the unjust charge of mismanagement too frequently attributed to the directors. Identity of fact and intention on the part of judges in reference to their awards might be speedily and effectually ascertained, if the judges, previous to the dismissal of the class they have just adjudicated on, would take the trouble of *comparing* each entry in their books with the name and number on the ticket they attached to the animal or article; and if a director could accompany them to see that this was invariably done, an important step towards satisfactory and harmonious action would be attained.

The rule originating, I think, in the Provincial, in several at least of our more important exhibitions, relative to fraud and deception is also justly amenable to amendment. Where fraud is patent and unmistakeable, as in the case of grain, good on top and bad below, for instance, there can be no possible objection to the judges summarily *rejecting* an exhibit, but in some other classes of the exhibition grave reasons present themselves against clothing judges with *summary* powers of rejection. For example, in ladies' work, in many of the classes it may fairly be declared as next to impossible to determine what has been wrought by the exhibitor and what has not; and instead of mere *suspicion*—perhaps most undeserved, being allowed to operate, a safer and more just course is for the judges to make their award to the article on exhibition deserving thereof, at the same time calling the attention of the directors to the existence of well-founded *suspicions* that the article exhibited was not the *bona fide* production of the exhibitor. In such a case the *responsibility would be placed where it should properly lie, on the directors*, who would then require that the most satisfactory proof be furnished to them of the *bona fides* of the exhibitor before the prize money was paid over. Is it not evident that the most gross injustice may be perpetrated on innocent exhibitors by *mere suspicion* being allowed sway on the part of judges, and permanent and serious injury thereby inflicted on the best interests of the exhibition. The difficulty of determining who would be the prize takers in such suspected cases could easily be obviated by the judges providing additional awards in each class, corresponding to the number of "suspects".

There are other matters that require ventilation also, meanwhile I desist, but may return to their discussion, time and opportunity permitting.

I am, &c,

EX-DIRECTOR.

"A correspondent who has of late been travelling a good deal in the counties of Oxford, Brant, Waterloo, and part of Wellington, informs us that "while in some rare instances the fall wheat is badly killed out, and in most cases injured to a greater or less extent "what *is* good is *good*," and the crop is likely, on the whole, to be an average one. Hay, he thinks, will be lighter than usual. Spring crops generally look well, and the prospects of a large yield of fruit, especially apples, was never better."

"A Subscriber" writes us, "a valuable mare of mine was recently, after a period of severe and protracted labor, delivered of a large, well formed, and apparently healthy foal, which however died in a few hours after birth. Would you please state your opinion as to what caused the death of the foal, and whether it would be safe to use the mare again for breeding purposes." *Answer*:—In all probability the death was due to the difficulty experienced in delivering the mare. We do not think there is any danger to be apprehended from again using the mare for breeding purposes.

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The Canada Farmer.

TORONTO, CANADA, MAY 31, 1873.

The Coming Crop.

From a large number of exchanges received as we go to press, we glean the gratifying intelligence that the crops throughout the country generally continue to look remarkably well, and that the prospects of an abundant harvest are daily becoming more encouraging.

The Hydraulic Ram.

Let no one start. We are not going to offer a learned dissertation upon the marvels of Hydrostatics; nor do we at all purpose arraying before our readers a descriptive series of leviathan machines of mighty force and fabulous price. This might be done. It would be an easy matter to show how, by means of hydraulic arrangements, a pound weight may be made to overcome ten thousand or more, and how tons of fodder can be compressed for exportation into masses of small compass only a few feet through. But these facts, interesting and wonderful as they are in themselves, would not prove sufficiently practical or beneficial to the general farmer to warrant us in proceeding with them—so we pass them over. Our task is a simpler one, and we will commence it at once. Have you plenty of water on your farm? If so be thankful, and if it is easily accessible to man and beast, you have indeed cause to rejoice.

We know of nothing so useful, so ornamental, or so valuable on the farm as a constantly rippling stream of pure fresh water. As a rule, our country is well supplied with it. There are comparatively few lots without their creeks, or ponds, or wells, and on all such the inexpressibly tedious labor of pumping and drawing is not known. But there are cases, also, in which the reverse of this is the fact: no running creek sufficiently large to be made available, and if they exist at all, they may be so located, or they may be so far apart, that their utilization seems utterly impracticable, whilst their capacity appears so trifling that even if they could be rendered available, one thirsty animal could drain them dry at a drink. They are in fact practically useless, and a nuisance on the place—their presence only serving to intensify a desire long ago generated, "O, if I could only utilize these waters; if they were only in any quantity, and near the house or barns, what an immensity of tedious and hard work they would save me. I could keep more stock, and treat them properly, whereas, under present circumstances, I find it almost impossible to supply enough to the few that necessity forces upon me. I could cool my milk house, freshen my orchard, water my garden, and render my water supply both useful and ornamental in a hundred different ways." There are other instances again in which the only approach to surface water is found in the shape of a reedy marsh or fen, which has proved but an eyesore for years, though may hap only a few steps from the door.

There are a few simple principles connected with water and water power, to know and understand which, almost immediately suggests to an ordinary mind, various methods of their practical application. In the first place, on assuming water to be constituted entirely of particles, which is quite true, its motion and course are directed wholly by pressure. The atmosphere above, weighing down upon the surface particles, causes these in turn to press upon and wedge themselves in between their subordinates, thus producing motion. This motion is transmitted from particle to particle throughout the entire mass, and of course it is continuous so long as there is an atmosphere to press, or a particle to be pressed.

Another principle is this: the deeper the water, the greater is the pressure on the lower particles. Of course this follows from the greater weight and bulk above them. Water running from a side hole near the bottom of a barrel, will do so with much greater force than through an orifice near the top.

But a stranger principle than either of those mentioned is the third, viz:—that the downward pressure of water depends not upon the quantity exerting that pressure, but upon the size of the base being pressed, and the vertical height of the column of water pressing upon it.

For instance, take a perfectly tight barrel closed at both ends, fill it with water, then insert a small quill tube tightly in the tap-hole and fill it also—the chances are that your barrel will burst. The reason is that the water in the small tube, although weighing perhaps not over an ounce *per se*, exerts a pressure upon the contents of the barrel, equal in weight to a column of water as high as the tube and as large around as the barrel. In fact, in this way a mere fractional quantity of water may be made to exert an almost infinite power. This principle is known in scientific works as the "Hydrostatic paradox."

Now, let us see how these can be applied, or rather how they are applied and utilized in the Hydraulic Ram—a simple machine costing from $9 upwards, and one which, when it can be used to advantage, may be made to carry water from any reasonable distance, to the kitchen, or bedroom, the barnyard, the dairy, any where in fact; or it may be employed for the purposes of ornament to maintain a fish-pond, or disport the sparkling element in jets and fountains all over the garden or orchard, and all this water strange to say, may have been taken from a much lower level of ground than that upon which it is distributed. Such is the use of the Hydraulic Ram. By means of it a small brook or spring may be made to force itself up to a very high point, whence the water may be distributed at pleasure—to return finally to its source.

In our next number we propose to give woodcuts illustrating the action and uses of this most useful machine.

State Entomologist of New-York.

We deeply regret to learn that the members of the Legislature of the State of New York have shown themselves so short-sighted and so niggardly as to withdraw their annual appropriation for the salary of Dr. Asa Fitch, State Entomologist, and thus to compel his resignation. For fifteen years Dr Fitch has labored hard, and done good service not only to his own State, but to the whole of North America, he has been the means of saving the agricultural community thousands—nay, millions of dollars, by his researches into the natural history of the insects affecting the wheat-plant and other field crops; and yet now in his old age, an ungrateful Legislature that can lavish thousands upon any whim or fancy of their own, cruelly cut off their benefactor's means of subsistence. It is certainly a great shame, and we do not wonder that the whole agricultural press of the Northern States are unanimous in their condemnation of the transaction From among many indignant article we quote the following remarks of a New York paper:

"For his contributions to useful science, Dr Fitch was made State Entomologist at the munificent salary of $1,000 a year. This position he has filled with credit and distinction, constantly laboring for the public welfare for some fifteen years. He is now, however, far advanced in life. Another generation has come upon the stage. The men who now rule at Albany know not the inestimable value to their fathers of Dr Fitch's scientific labors They are squandering millions on a granite capital, while the farmers' friend who has saved untold millions to the country is turned out like a worn-out horse to starve. Is this to be held up as an incentive to the rising generation of young men to study agriculture and kindred sciences? Entomology is so closely connected with scientific agriculture and horticulture that it is impossible to separate the two. No man can be called learned in one, without knowing more or less of the others The fifteen volumes which Dr. Fitch has contributed to science are monuments that will endure long after the new architectural glories of Capitol Hill have crumbled to dust. How unlike is our treatment of this worthy man to that meted out to Humboldt and other scientific men abroad in their old age.

"In the name of common gratitude we call upon our Legislature to reconsider their petty parsimony and repair this gross injustice. There is life and usefulness in the old man yet, continue the paltry pittance that has been paid to him for years past until he steps off the scene, and place a young and active assistant under his charge, whom this veteran can train to carry forward the great work of usefulness in which he has so successfully been engaged."

Planting Timber.

Our firewood is rapidly decreasing, and in many localities our timber for other purposes has altogether dissappeared. It is useless now to talk of improvidence. The mischief is done. Old residents have seen splendid tracts of pine and hardwood timber burnt on the ground, that would now be three times the value of the land on which it formerly stood, high priced as that land now is. We cannot grow, in this generation, the slow growing hardwood of a size sufficient to replace the original forest. But we can grow many kinds of the soft woods that will become of great value in ten or fifteen years, such as cotton wood, poplar, hackmatack, poplar abeles, horse chesnut, locust, bass, sycamore, and many other kinds of soft quick growing trees. We may feel somewhat disposed to hold this class of trees in little esteem just now, but when it becomes a question of these or none, opinion will probably be considerably modified.

In Britain, timber or brushwood is never uselessly burnt, all is saved. A large quantity of fuel is obtained from the trees standing in hedge rows, and from the hedge rows themselves. It has been from time immemorial the custom to "lop," as it is sometimes called, the branches of trees so situated as to throw a shadow on the northern aspect, more especially where this shade is injurious to the neighboring landholders, and from this source, many farmers are largely supplied.

Why should not our Canadian farmers be providing such a supply for future contingencies. Belts of such wood can be planted at small cost around the homestead and along the fences, and so arranged as to locality, as to form a most welcome shade for cattle in summer, as well as a break for winter winds. To avoid too much shade it is advisable to plant on lines running north and south, except immediately about the homesteads. Which should be surrounded with such plantations. Great benefit would also result from these belts of trees by preventing the snow being driven off the wheat fields in the winter months.

In ten years, the fire wood annually obtained from present planting might fully supply the demands of our rural population, and by judiciously mixing the quick-growing trees with those of slower growth, the supply would be an increasing and improving one.

Wool.

The N. Y. *Economist*, the leading journal of the financial and commercial interests of the U. S., publishes extracts from circulars of eminent firms connected with the wool trade in this country and England, tending very positively to show that "good prices throughout the coming year may be anticipated." By the way, a short time since the wool speculators from the East attempted to forestall the wool growers at the West, in the quiet purchase of all the stocks on hand. The attempt was discovered in time to prevent its success, and by a concerted action, which farmers can so seldom take, they determined to hold on to their fleeces until such time as a fair price could be obtained from the agents of the manufacturers, and for once at least they were successful. If in every neighborhood of ten miles square an agricultural club could be formed, as we have so often urged, and to which Dr. Stewart in an article in this number also calls attention, the farmers would be able in many cases to protect themselves from imposition.

U. S. Farmers in Convention.

In Illinois, and more recently in New York, conventions have been held in the direct interest of the producers of the country to secure cheaper rates of transportation. The complaint is a general one throughout the country, that freight charges on the railroads are so high that the producers can make no visible profit, and therefore combinations are forming amongst them to compel such a reduction of the rates as will leave some sort of a living margin to themselves. The thing to establish in this age of railroads is this, that the producer and consumer have but a like interest with the carrier; separate one from the other, and instead of harmony and consequent prosperity, we have a distraction of forces and a corresponding decay of interests. The New York meeting adopted a series of very plain and emphatic resolutions concerning the rights of the people and the first duty of railroads to advance them by serving them. It indicated in unequivocal terms the determination of the great body of the people—producers and consumers alike—to resist all unreasonable and extortionate charges that, on the one side, take from the profits of production, and, on the other, increase the cost of consumption. —*Mass. Ploughman.*

The Texas Pressure Meat Company.

This company is being formed for the purpose of manufacturing preserved meats and meat extracts in Texas, with which object it is intended to work the process patented by Mr. T. F. Henley, in that part of the United States. We learn from the prospectus of the company that there are about ten million head of cattle in the State Texas presents many advantages for working this trade over South America or Australia, not the least important being the fact that the ports of Indianola and Galveston are within 20 days' voyage of Liverpool or London. The advantages of Mr. Henley's process over other systems adopted appear to be as follows:—

Firstly.—The hydraulic process is used for the instantaneous removal of a certain amount of meat juice from the fibre. Not only does this preserve the fibre, and facilitate its being tinned, salted, or otherwise dealt with, but it yields a product which constitutes the best concentrated form of meat essence ever introduced for public consumption.

Secondly—By pressure, the constitution of the solids of meat is not altered; there is simply a separation of some extractive juices, and the pressed meat, weight for weight, contains more nutriment than unpressed meat.

It is proposed to preserve one hundred bullocks daily, and to combine, with the profitable business of meat preservation, the manufacture and utilization of every product that can be obtained from such an establishment.

Kelley Island Grape and Wine Crop of 1872.

From an article contributed by Addison Kelley, Esq., to the *Vine and Fruit Reporter*, we gather that the crop of 1872 was less than one half of 1871. That the amount of wine made in 1872 was 120,000 gallons. That the amount of grapes raised was 1,117,583 pounds. The price of wine has ranged at wholesale at from 55 to 80 cents a gallon, leaving as we think a poor show for the grape producers of Kelley Island. Some estimates are made of 12 pounds of grapes making one gallon of wine, but Mr. Kelley takes a good common sense view and thinks 16 to 17 pounds nearer the true mark. The whole of this is to us, another item teaching careful thought relative to the true modes of culture of the vine. —*T. R. Elliott.*

Good Wheat.—Mr. John Douglas, 9th line, showed us on Saturday last a sample stalk of wheat, taken at random from a field of six acres, it measured nearly two feet in length, and shows a growth remarkable so early in a season which has been cold and backward to an unprecedented extent. If the fall wheat generally equal to this—and we hear favorable accounts of it—we may look for another abundant harvest.—*Meaford Monitor.*

Long Rest of Bulbs.—At Redleaf, the Guernsey Lily (*Nerine sarniensis*) has thrown up a flower spike, after resting for five years. The plant is in a warm border in front of the conservatory. Some few years back there came up in the same border a flower-stem of a bulb which must have been planted ten years before, and it proved to be the lovely *Colochortus Venustus*, but it has appeared since. In the same border *Maraca*, or *Vieusseuxia pavonia*, has flowered annually for this last twenty-six years. —*Garden.*

Sheep Killed by Dogs.—Of late we have heard numerous complaints of costly sheep being worried by dogs, and no remuneration or reparation can be had now that the dog-tax has been abolished in the township. This tax is a proper one, and should be again levied both in town and township. It would not only serve to lessen the number of useless and destructive mongrels, which is very desirable, but even if half the value of sheep killed by dogs were refunded, it would be a great boon to stock-rasers—*Expositor.*

The present population of South Australia, is estimated at 192,000, and the land alienated at about 5,000,000 acres. The average aggregate yield of the harvests for the past ten years has been, in round numbers, 4½ million bushels of wheat, in addition to which, of course, other cereal and root crops are grown. Of live stock, in 1871, there were in the colony 4,412,055 sheep, 143,463 horned cattle, 85,009 horses, and 95,542 pigs, &c. The last vintage yielded 852,000 gallons of wine, obtained from 5,440,477 vines grown on 5455 acres.

A four-hundred acre sugar-beet field has been seen, recently, by the editor of the *Pacific Rural Press*, at Davisville, Yolo County, Cal. The beets were in rows, about fifteen to eighteen inches apart, and were up four or five inches. Twenty-five Chinamen, with hoes, were "sweeping in broad platoon to and fro across the field, extirpating the few small weeds that had made their appearance since planting." These beets belong to the Sacramento Valley Beet Sugar Company, which has 1,600 acres of them under cultivation.

Stoppage of our Export Cattle Trade with Australia.—The Council of Delegates assembled at Sydney, sent up from all parts of the colony, besides other important matters, had recently under consideration the importation of foreign live stock. They concluded that foot-and-mouth disease, pleuro-pneumonia, and other catching disorders, had been brought from England to the colony, and they advised that for two years no cattle, sheep, or pigs should be brought into Australia. The Sydney Legislative Council, then sitting, at once agreed to this rather extreme measure, and passed it into law. The Melbourne Council, which has since considered the question, has done the same. Exporters have been in trepidation lest animals purchased and awaiting shipment should, in pursuance of the advertisement which appeared, be prevented sailing. The colonial authorities in this country, however, postponed for a week or two the operation of these restrictive measures; several lots of cattle and sheep—including Shorthorns, Herefords, Devons, with Lincoln and Leicester sheep—are going off, the bull purchased for a thousand guineas from the Duke of Devonshire, it is understood, will be despatched; but within a few days the exportation of all cattle, sheep, and pigs to the Australian colonies will for the present be brought to a close.—*North British Agriculturist, April 23d.*

Hops as Manure.

The value of hops as taken from the brewery have been highly lauded as manure for the growing of vegetables, &c. Henderson in his "*Gardening for Profit*" gives the value of waste hops as superior to the best of stable manure; but we notice a writer in the *Country Gentleman* demurs to its value—we suppose mainly on the ground that intrinsically and chemically there is in this waste little material of practical available food for plant life, beyond a certain unreliable disposition to fermentation. We say unreliable, because we have found a pile of refuse hops drawn direct from the brewery to give out a great amount of heat at certain points while at others the mass would be cool. Their value we have ever counted only as connected and mingled with fresh stable manure, giving a tone toward fermentation, and thus supplying heat to the bottom growth of plants in a hot-bed frame.—*E. R. Leavitt.*

Keeping Work Ahead.

The great trouble with most farmers is that we lay out too much work for ourselves to do. We get a great many things half done, and work twice as hard as need be, when the same amount of labor judiciously expended would have effected it all. This is just how it is in the wrong end of. We are so accustom. I to get into a "hurry" about getting in the crops in time that we forget the weed crop is already in, and going on at a rapid pace. We have not unfrequently seen the garden fairly overrun getting in seeds or plants that would have kept as well a week later, when the time spent in harrowing or weeding ground, would have been equal to four times the time at first expended. These remarks of course apply more to garden than to farm work. Where horse-power is at hand, weeds half an inch high, if annual weeds, or roots to be destroyed by a broad tooth cultivator, and if they were but just pushing through the ground, but in garden work a simple raking up of the ground when the weeds are just sprouting is quite as effective as the best hoeing would be. An hour or two raking of a garden between the rows of the various crops will in fact almost render hoeing unnecessary, and thus save many a hard day's work.—*Rural World.*

Cleaning Harness.

It is just as well to know that we should clean and oil the harness at least once a year to keep it in good condition, and therefore, the worst of wear as much as possible. Don't let the job out to the harness-maker, but some of these stormy days, when the harness is not in use just be down into the workshop and commence operations. Take the harness all apart, and scrape off all mud, hairs and dirt, and wash the leather clean with soap and hot water. Then heat 2 or 3 quarts of neat's foot oil in a long shallow pan, and draw each piece of leather through it slowly, bending the leather backward and forward, and rubbing the oil in with a cloth or sponge. Hang near the fire to dry and repeat the process until the leather is saturated with oil; mix a little lampblack with clean tallow, and with a cloth rub it into the leather while warm, until the pores are filled and the surface becomes smooth and glossy. If a harness is oiled in this way it is never gummy, and will, therefore, keep a long time. Sometimes linseed oil or adulterated oils are used, but they dry on the leather and make it gummy, dirt and hairs stick to it, and the harness gets so filthy as to soil everything it touches. After the harness has had a good oiling an occasional rubbing with tallow and lampblack will keep the leather tough and pliable, and prevent it from cracking.

Vegetables on the Farm.

Farmers and others who rely on their crops for a living could well afford to pay more attention to the raising of vegetables for sale. It costs but little more time to have a variety than to have the one crop of potatoes only, as is too often the case. Our most thriving farmers around our cities, are those who cultivate a variety of vegetables and sell them with their market produce once or twice a week. One of the most successful farmers we know of grows largely of fruits and vegetables, has a large dairy and his own waggons distributing milk. As fast as his various crops are ready they are taken to the city daily and sold directly to those who will use them. He makes a point of getting in his crops early, and often is first in the market with potatoes, asparagus, beets &c. It is well-known how soon the proceeds of sales from the sale of *bed of dahlias* reaches ten or twenty dollars, and it is astonishing how soon a few extra articles added to the waggon load will count up. All farmers mainly agree on the absolute necessity of a good dairy. Indeed on many farms, even so far as fifty miles from the cities, it is the main reliance; the profits from this source alone in very many cases paying the rent and expenses. When with this is brought daily to the city a full assortment of vegetables, the owner may be sure he will "get along."—*Panama Telegraph.*

Rules for Handling a Gun.

I. Never handle a gun unless you know how; nor suffer any person over whom you have control to handle one unless he knows how. You have no right to endanger your own life, or the lives of others by handling a dangerous weapon in any other than the safest manner.

II. Always handle a gun as if it was loaded; never let it point at yourself or any one else; never point a loaded or unloaded gun at any living thing unless you mean to kill. Hardly a week elapses that the papers do not report that some idiot has snapped a gun at his wife or daughter, supposing it unloaded, and has therefore had the misfortune to kill a human being. The gallows should rid the community of such unmitigated fools.

III. Always carry your gun at half-cock, never with the hammer upon the cap. This rule is almost invariably violated by countrymen. A few experiments demonstrate its correctness.

1. Half cock your gun, if it will pull off in this condition, take an axe and split the stock, bend the barrel and sell it for old iron.

2. If it will not pull off put a cap on the cone and let the striker down upon it, now strike the back of the hammer with a stone or against the door jamb, and if the striker hits the cone decently well the cap will be exploded. This is what happens when a man carrying a loaded gun with the striker down upon the cap, shoots himself while riding in a waggon, in tumbling down, or in climbing over a fence or stone wall.

3. Put a cap upon the cone and let the strike back almost to half-cock and let it fall. If the mainspring is good for anything, the cap is exploded. More accidents happen in this way than in any other. A gun is carried through underbrush dragged out of a boat, pulled on the ground by the muzzle, your dogs jump upon you, the hammer catches in your clothing; in either of these, and in a hundred other ways, the hammer is liable to be drawn back almost to half-cock, and then let fall upon the cap. If the gun is a good one an explosion ought always to follow.

4. Now half-cock your gun, draw the hammer back nearly to full cock and let it fall. It will stop in the half cock notch, and no blow is given. So always carry your gun at half-cock. If you cock it, expecting to get a shot and are disappointed, hold the muzzle straight up in the air, and let the lock back at half-cock.

IV. If you know of no other way of ascertaining whether a gun is loaded or not, than by putting it in your mouth and blow, or if you feel inclined to draw the cap, retire to a safe distance and at once blow out your brains, if you have any, before you kill or maim other people by your stupidity and carelessness.—*American Sportsman.*

Paper as a Material of Construction.

The *Iron Age* contains an article on the use of paper as a material of construction from which we condense as follows:—Whether or not we are about to enter upon what will be known in the future as "The Paper Age," has lately become quite an interesting topic of discussion. Be this as it may, there is evidently a future for paper, in which it is to become the general, if not universal, substitute for wood, leather India rubber, and, to some extent, copper, tin, and zinc. During the past few years a great deal of attention has been given to this subject, and the results already attained, though comparatively unimportant in themselves, show the possibilities of this material and its more or less perfect adaptation to a thousand uses to which no one has yet thought of applying it. In proportion to weight, it is probably the strongest material known, and combines more perfectly than any other substance, the qualities of strength, lightness, flexibility, durability, and cheapness. So many and various are the materials of which it can be made, that it can be manufactured in quantities practically unlimited in every civilized country in the world, and so long as plants grow, paper manufacture can be sustained. It is under all circumstances, an easy material to work and handle, in short, it possesses every requisite quality, and, like many another material now indispensable, its utility is discovered just as we are beginning to feel the need of something cheaper and more abundant than wood, leather, and hard rubber to substitute for them.

Some idea of the diversity of uses to which it has already been applied may be inferred from the fact that at the recent fair of the Franklin Institute, the display of articles made wholly, or in great part, of paper, comprised oil cloth, patent leather, and leather suitable for insoles, gas pipes, whip handles, saw handles, knives and forks, combs, buttons, washers, roofing, and car-wheels. There are also many other uses to which it has been adapted, which were not shown, such as slats for window blinds, panels for doors and ceilings, boots, cellars, cuffs, bosoms, etc. The Japanese, in fact, make almost every possible article of clothing of paper, from a pocket-handkerchief to an overcoat. Even iron is not adapted to uses so widely various, and certainly no other material has yet been found which, at the same cost, could be made to answer so many purposes. These it must be remembered, are but the first fruits of American inventive talent, as yet scarcely stimulated in this direction; and what may we not expect when, with a growing demand for manufactures of paper, there shall be more inducement than now offers for investigation and experiment. Why cannot our railroad cars be made of paper, instead of iron, as proposed, so as to prevent the danger of splintering and burning in case of accidents? As timber becomes scarce, our houses can be entirely built of paper. It is said that the paper pulp can be readily brought to such a state of toughness and solidity, by pressure, so as to be almost as fire-proof and indestructible as iron. It requires but little further progress in this new branch of manufacture to so perfectly and universally adapt it to all the varied requirements of the human family, that "the coming man" would have little use for anything else from the time he was placed in his paper cradle until he should be "gathered to his fathers" in a paper casket.

Copper and gold will conduct electricity six times better than iron or tin, and twelve times better than lead. Zinc will conduct nearly twice as well as iron, silver more than four times better.

Do it Well.—There will be an inclination on the part of farmers this spring to slight the work of preparation of the soil. There will be much work to do in a short time, with little help, and too many will think that for this once it will do to get over the ground in the quickest and easiest way. Let us urge all who are thus oppressed, to consider the result. Cultivate less land and do it well, the crop will pay as well on a small space well tilled, as on a broad area half cultivated.—*Mirror and Farmer.*

Peat Beds are largely utilized in Europe. They are converted into a kind of wool or wadding, which is used for upholstery instead of hair. A kind of flannel is also made from this fibre, which is said to be very superior for many hygienic uses, as for rheumatism and skin disease. Vests, drawers, loose shirts, etc., are also made. In the process of manufacture an ethereal oil is also obtained, very useful as a solvent, and as a curative agent. Gas is also made from the refuse and used for lighting the manufactories, or the entire refuse may be pressed into the form of bricks, when it becomes a most excellent substitute for coal.

Manures. Manures must not be so exposed that the dashing rains will wash *everything* soluble out of them. Let the soluble elements find their way to the soil, rather than to creeks and rivers. Economy, or the want of it here, is enough to make a nation rich or poor. It will not pay to let manures flow to creeks and rivers, and then go to the Guano Islands to get them back again. Cart manures to convenient places and all the better if they are protected by a coating of earth till ready for use. Spread no more than can be plowed in each day, especially on hill sides. All manures not used in the spring should be thoroughly composted and protected for future use.—*Ex.*

A Novel Method of Catching Mice.—A Correspondent of the *Journal of Pharmacy* says, "Having noticed mice in our seed barrels, I bethought me how I might trap the little intruders. I thought of saturating a piece of cotton with chloroform and throwing it in, then closing the lid. On raising it again in a few minutes, I would find that life had almost or quite departed. Having on one occasion left the piece of cotton in the barrel, on again returning, I found three mice with their heads in close contact with it and dead. In the evening I saturated another piece and placed it in the barrel, and on opening it the next morning, to my surprise I found nine dead mice."

Apiary Department.

Humble Bees.

At this spring time of the year, one can hardly fail to be attracted on a warm sunny day, by the humble or bumble bees, exploring banks and corners, or buzzing about the yellow catkins of the willow. The big, handsome, yellow, uniformed individuals seen now, are the queen-bees, or females; who alone have lived through the winter, and who are searching for a suitable place, for the home of a new colony. They usually select the deserted winter quarters of a field or barn-mouse, where they find a nice, soft mass of dry hay and moss, all ready for their purposes. In this the queen stores a little pollen and honey, gathered from catkins and early spring flowers, and lays in it half a dozen to a dozen eggs; then she gathers more pollen and honey, and lays more eggs, till the colony is complete. Oftentimes, when no mouse's nest is to be found, the bees have to construct their own habitation under a stump, or in a sheltered bank; this is done with considerable labor, and with no little skill The process is thus described by Kirby & Spence, in their *Introduction to Entomology*:

"The upper part or dome of the nest is composed of a thick felted covering of moss, having the interior ceiling coated with a thin roof of coarse wax for the purpose of keeping out the wet. The entrance is in the lower part, and is generally through a gallery or covered way, sometimes more than a foot in length and half an inch in diameter, by means of which the nest is more effectually concealed from observation. On removing the coping of moss, the interior presents to our view a very different scene from that witnessed in a bee-hive. Instead of numerous vertical combs of wax, we see merely a few irregular horizontal combs placed one above the other, the uppermost resting upon the more elevated parts of the lower, and connected together by small pillars of wax. Each of these combs consists of several groups of pale-yellow oval bodies of three different sizes, those in the middle being the largest, closely joined to each other, and each group connected with those next it by slight joinings of wax. These oval bodies are not, as you might suppose, the work of the old bees, but the silken cocoons spun by the young larvæ. Some are closed at the upper extremity; others, which chiefly occupy the lower combs, have this part open. The former are those which yet include their immature tenants: the latter are the empty cases from which the young bees have escaped. On the surface of the upper comb are seen several masses of wax of a flattened spheroidal shape, and of very various dimensions: some above an inch, and others not a quarter of an inch, in diameter; which on being opened, are found to include a number of larvæ surrounded with a supply of pollen moistened with honey. These, which are the true cells, are chiefly the work of the female, which, after depositing her eggs in them, furnishes them with a store of pollen and honey; and when this is consumed, supplies the larvæ with a daily provision, as has been described in a former letter, until they are sufficiently grown to spin the cocoons before spoken of. Lastly, in all the corners of the combs, and especially in the middle, we observe a considerable number of small goblet-like vessels, filled with honey and pollen, which are not, as in the case of the hive-bee, the fabrication of the workers, but are chiefly the empty cocoons left by the larvæ. It falls to the workers, however, to cut off the fragments of silk from the orifice of the cocoon, which, after giving it a regular circular form, they strengthen by a ring or elevated tube of wax made in a different shape by different species; and to coat them internally with a lining of the same material. They even occasionally construct honey-pots entirely of wax"

Humble bees are much more amiable in their disposition, than either honey-bees, for their fierce cousins the wasps; their sting also does not produce such grievous pain and swelling as that of the others.

The population of a humble-bees' nest may be divided into four orders of individuals: the large females, the small females, the males, and the neuters or workers

The *large females* are the original founders of the colonies, and are the individuals that we see at this time of the year. They are often so large, that by the side of the small ones, or workers, they look like giants besides pigmies. They issue from the pupa state in the autumn, and then pair with males produced about the same time from the eggs of small females. They pass the winter underground, and early in the spring, as we have already mentioned, lay the foundations of a new colony, all the old inhabitants, except themselves, having perished before winter.

The *small females* produce only *male* eggs, which come out in time to fertilize the young queens of the larger size. M. Huber relates that when watching at midnight the proceedings of a nest which he kept under a glass, he observed the inhabitants "to be in a state of great agitation; many of these bees were engaged in making a cell; the queen-mother of the colony, as she may be called, who is always extremely jealous of her pigmy rivals, came and drove them away from the cells; she in her turn was driven away by the others, which pursued her, beating their wings with the utmost fury, to the bottom of the nest. The cell was then constructed, and two of them at the same time oviposited in it. The queen returned to the charge, exhibiting similar signs of anger; and chasing them away again, put her head into the cell, when seizing the eggs that had been laid, she was observed to devour them with great avidity. The same scene was again renewed with the same issue. After this, one of the small females returned, and covered the empty cells with wax. When the mother-queen was removed, several of the small females contended for the cell with indescribable rage, all endeavoring to lay their eggs in it at the same time. These small females perish in the autumn.

"The *males*"—to quote again from Kirby and Spence, "are usually smaller than the large females, and larger than the small ones and workers. They may be known by their longer, more filiform, and slender antennæ; by their different shape and by the beard of their mandibles. Their posterior tibiæ also want the *corbicula* and *pecten* that distinguish the individuals of the other sex, and their posterior plantæ have no auricle. We learn from Reaumur that the male humble-bees are not an idle race, but work in concert with the rest to repair any damage or derangement that may befal the common habitation.

"The *workers*, which are the first fruits of the queen mother's vernal parturition, assist her, as soon as they are excluded from the pupa, in her various labors. To them also is committed the construction of the waxen vault that covers and defends the nest. When any individual larva has spun its cocoon and assumed the pupa, the workers remove all the wax from it; and as soon as it has attained to its perfect state, which takes place in about five days, the cocoons are used to hold honey or pollen. When the bees discharge the honey into them upon their return from their excursions, they open their mouths and contract their bodies, which occasions the honey to fall into the reservoir. Sixty of these honey-pots are occasionally found in a single nest, and more than forty are sometimes filled in a day. In collecting honey, humble-bees, if they cannot get at that contained in any flower by its natural opening, will often make an aperture at the base of the corolla, or even in the calyx, that they may insert their proboscis in the very place where nature has stored up her nectar. M. Huber, relates a singular anecdote of some hive-bees paying a visit to a nest of humble-bees placed under a box not far from their hive, in order to steal or beg their honey, which places in a strong light the good temper of the latter. This happened in a time of scarcity. The hive-bees, after pillaging, had taken almost entire possession of the nest. Some humble-bees, which remained in spite of this disaster, went out to collect provisions; and bringing home the surplus after they had supplied their own immediate wants, the hive-bees followed them, and did not quit them until they had obtained the fruit of their labors. They licked them, presented to them their proboscis, surrounded them, and thus at last persuaded them to part with the contents of their honey-bags. The humble-bees after this flew away to collect a fresh supply. The hive-bees did them no harm, and never once showed their stings; so it seems to have been persuasion rather than force that produced this singular instance of self-denial. This remarkable manœuvre was practised for more than three weeks; when the wasps being attracted by the same cause, the humble-bees entirely forsook the nest.

The workers are the most numerous part of the community, but are nothing when compared with the numbers to be found in a vespiary or a bee-hive: two or three hundred is a large population for a humble-bees' nest, in some species it not being more than fifty or sixty. They may more easily be studied than either wasps or hive-bees, as they seem not to be disturbed or interrupted in their work by the eyes of an observer."

Feeding Bees.

No bee-keeper can have the best success that does not understand the necessity for timely feeding. Few resort to it at all, while very few are even aware of its importance. Our standard authors either pass over the subject in a careless way, or condemn it altogether.

Mr. Hosmer, whose wonderful success has made everybody stare with wonder and incredulity, stated, at Indianapolis before the North American Bee-Keepers' Society, that "the whole theory was to keep the bees feeding all the time when they can get no honey in the fields, regardless of the time of year."

We propose briefly to notice the conditions under which it is either necessary or beneficial to feed bees.

1. In the spring of the year the queen will not breed much, until honey is being gathered rapidly by the bees, so that by the time the colony becomes populous enough to gather much honey, a considerable part of the best of the honey season is past, and frequently, in some localities, all of it. By commencing as soon as the bees can fly out, and continuing to feed until the flowers yield honey, a month's time may be gained, and the surplus honey increased fourfold. It once commenced it must be continued, and enough food given to feed the growing brood; for, to stop when the comb is filled with brood and eggs would result in starvation and death. The feeding should not be too abundant, as the bees will fill the comb-cells, and leave the queen no room to lay, and besides, it would be an unnecessary waste. A few table-spoonfuls, at first, will do; but, as the brood increases, the quantity should be increased to a half pint or more each day.

2. It frequently happens in the spring, after the honey harvest begins, and the hive is full of brood in all stages, that a sudden change of weather cuts off the supply, and even confines the bees to the hive, and unless a supply of food is furnished, the queen will cease to lay, and perhaps much of the brood perish. At such a time feeding will be profitable.

3. There is no season of the year in which there are so many colonies of bees die out as in the early spring, before the flowers yield honey, the bees having exhausted all their winter stores, die of starvation, or in their extremity swarm out and either go off, or join other colonies that have a supply—it may be only to hasten the destruction of their hospitable neighbors. Even if a regular system of feeding is not adopted, the bee-keeper should examine all of his stocks at the opening of spring, and feed those needing it.

4. In the fall of the year a good bee-keeper will strengthen all his weak colonies by liberal feeding. In this instance the food should be given as fast as the bees will take it, so that it may be capped over before winter, otherwise it may ferment and produce disease.

5. Where supers or boxes are used, the bees will not deposit honey in them until the brood chamber is filled. Sugar, syrup, or dark honey may be fed to them to do this with, so that the nice clover-honey may be deposited in the boxes.

6. At the end of the honey season some boxes will be not quite full. Honey may be fed to the bees to finish them out.

7. When bees are afflicted with dysentery or cholera, or other disease induced by bad honey, or infection in it, all of their stores should be taken from them, empty combs given them and then they should be supplied with pure sugar syrup. Or if no empty comb can be procured the infected comb should be emptied of its honey with the melipult, and after being thoroughly fumigated with the smoke of *burning sulphur*, exposed to the air for a few hours and returned to the hive, and the syrup fed to the bees to be stored in it.

8. When the nucleus system of swarming is resorted to, (that is setting up small colonies and building them up,) it cannot be depended upon with certainty, unless any deficiency or cessation of natural forage is made up by feeding.

9. The queen breeder cannot pursue his business with much success, except while honey is abundant, unless he resorts to timely feeding, and when it is

necessary to shut up or confine the bees, even if they have honey in the comb, it is best to give them some food, as it keeps them better satisfied, and enables them to go on with their work, and if a queen is present there will be no occasion of overpositing.

The natural food of bees in nature state is saccharine juices or secretions of plants known as sugar, ordinarily grape or fruit sugar, as they are the most accessible; but as they are never in nature free from other secretions of the plants they never ably vary. Cane sugar generally is purer and furnishes the best food. It may be stated as an ascertained fact that the purer the sugar, and the freer it is from any foreign substance, the better it is suited to the sustenance of the bees. Pure white sugar, dissolved in water with a little heat, so as to be of the consistency of their honey, is the best food that can be given.—*Louisville Weekly Ledger*

Breeder and Grazier.

King of Troy.

The annexed woodcut is the portrait of the imported Cotswold Ram, *King of Troy*, owned by John Snell & Son, of Edmonton, County of Peel, Ontario. He is said to be a remarkably fine animal and likely to leave his mark on the Edmonton Flock. Cotswolds continue to hold their own well against all comers—the demand being as great and the prices as good as ever. Mr. John C. Snell promises to keep the reputation of his Herd and Flock fully up to the mark achieved by his late father.

MR. SNELL'S IMPORTED COTSWOLD RAM.

Short-horn Intelligence.

Lord Penrhyn's great sale of Bates Short-horns came off at Wicken Park, England, on the 8th May, as advertised. We find in *Bell's Weekly Messenger* a full account of the proceedings at the sale which attracted a large amount of interest throughout England. A large number of Peers and Members of Parliament were present, and nearly 500 guests sat down to the luncheon served on the grounds in a double marquee. The Lots sold were as follows:—

Cows and Heifers.

1—Clara, calved 7th, May 1864, by Duke of Geneva (19614), from Cressida $199
2—Juno, 22nd August 1864, by Duke of Geneva (19614), from Julia 472
3—Julietta, 22 February 1865, by Grand 3rd Duke (16182), from Junia by Duke of Gloster (11382) $92
4—Eugenie, September 1, 1866, by Economist (21669), dam Empress) by Golden Horn (16166) 267
5.—Jewess, November 1, 1866; by 2d Duke of Geneva (21666), dam (Julia) by Napoleon 3d, (16602) 1102
6.—Duchess of Lancaster 11th, Aug 20, 1867; by Duke of Geneva (19614), dam (D'ss of Lancaster 5th) by Marma duke (14897) 457
7.—Waterloo 26th, Aug. 21, 1867; got by Duke of Geneva (19614), dam (Waterloo 24th) by Cherry Duke 2d (14265) 2362
8.—Jessamine, Feb. 7, 1868; by Second Duke of Geneva (21591), dam (Juno) by Duke of Geneva (19614) 305
9.—Cherry Duchess 13th, March 16, 1868; by Third Duke of Wharfdale (21619), dam (Cherry Duchess 9th) by Marma duke (14897) 2913
10.—Cherry Duchess 14th, Sept 12, 1868; by Third Duke of Wharfdale (21619), dam (Cherry Duchess 10th) by Duke of Geneva (19614) 3963
11—Charity, Dec. 22, 1868; by 11th Grand Duke (21849), dam (Cressida) by Mac-Turk (14872)...267
12.—Japonica Feb. 8, 1869; by 2nd Duke of Geneva (21591), dam (Juno) by Duke of Geneva (19614) 577
13—Duchess of Lancaster 12th, April 25th, 1869; by 11th Grand Duke (21849), dam (Duchess of Lancaster 7th) by Marmaduke (14897) 325
14—Cowslip 3d, May 30, 1869, by 11th Grand Duke (21849), dam (Cherry Checks) by MacTurk (14872) 420
15. Jessica, July 3, 1869; by 2nd Duke of Geneva (21591), dam (Julietta) by 3rd Grand Duke (15182) 566
16—Judith, July 9, '69, by Cherry Duke (27752), dam (Jewess) by 2nd Duke of Geneva (21591) 527
17—Waterloo 30th, July 23, 1869; by 3rd Duke of Wharfdale (21619), dam (Waterloo 26th) by Duke of Geneva (19614) 2,625
18—Cheerful, August 7, 1869, by Cherry Duke (27752), dam (Juna) by Duke of Gloster (11382) 577
19—Jemima, Nov. 1, 1869, by Cherry Duke (27752), dam (Julia) by Napoleon 3rd (16602) 550
20. Jewel, June 24, 1870; by Cherry Duke (27752, dam (Jewess) by 2d Duke of Geneva (21591) 945
21—Wellingtonia 8th, July 26, 1870; by Cherry Duke (27752), dam (Wellingtonia 7th) by 3rd Duke 4th (19874) 1,365
22—Waterloo 33rd, July 20th, 1870; by 11th Grand Duke (21849), dam (Waterloo 25th) by Duke of Geneva (19614). 2,857
23—Crystal, July 16, 1871; by Third Duke of Grafton (28395), dam (Charity) by 11th Grand Duke (21849). 350
24.—Cowslip 4th, Aug. 3, 1873; by 11th Grand Duke (21849), dam (Cherry Checks) by MacTurk (14872) 603
25—Waterloo 36th, Aug 17, 1871; by 11th Grand Duke (21849), dam (Waterloo 26th) by the Duke of Geneva (19614) 1,601
26—Duchess of Lancaster 13th, Sept 14, 1871, by 11th Grand Duke (21849), dam (Duchess of Lancaster 7th) by Marmaduke (14897). 315
27—Waterloo 37th, May 31, 1872, by Oxford Beau (29485), dam (Waterloo 30th) by 3rd Duke of Wharfdale (21619) 2,178
28—Duchess of Lancaster 14th, July 16, 1872; by 11th Grand Duke (21849), dam (Duchess of Lancaster 11th) by Duke of Geneva (19614) &c 278
29—Cherry Duchess 20th, Aug. 5, 1872; by 11th Grand Duke (21849), dam (Cherry Duchess 12th) by Duke of Geneva (19614) 2,651
30.—Cherry Duchess 21st, Dec. 30, 1872; by 11th Grand Duke (21849), dam (Cherry Duchess 13th) by 3rd Duke of Wharfdale (21619). 1,601
31.—Cowslip 5th, Jan. 22, 1873; by Oxford Beau (29485), dam (Cowslip 3rd) by 11th Grand Duke (21849) 267

Bulls.

32.—11th Grand Duke (21849), red, July 16, 1863; by Lord Oxford (20214), dam (Grand Duchess 8th) by Prince Imperial (15095).—420 gs. reserve. No bid
33.—5th Cherry Duke (28173), red, Aug. 14, 1870; by 11th Grand Duke (21849), dam (Cherry Duchess 9th) by Marmaduke (14897) 1,443
34.—6th Cherry Duke, red, Jan. 16, 1871; got by 11th Grand Duke (21849), dam (Cherry Duchess 11th) by Duke of Geneva (19614).....1,916
35.—Duke of Oxford, March 3, 1871; by 11th Grand Duke (21849), dam (3rd Belle of Oxford) by Marmaduke (14897)... 420
36—4th Duke of Wellington, Aug. 17, 1871; by 11th Grand Duke (21849), dam (Waterloo 25th) by Duke of Geneva (19614). 1,785
37—Clarendon, Aug. 25, 1871; by 11th Grand Duke (21849), dam (Clara) by Duke of Geneva (19614) 525
38. 7th Cherry Duke, Oct 3, 1871; by 11th Grand Duke (21849), dam (Cherry Duchess 9th) by Marmaduke (14897). 1,207
39—5th Duke of Grafton, April 9th, 1872; by 11th Grand Duke (21849), dam (Dowager) by Duke of Geneva (19614) 525
40—Stanley, July 22, 1872; by Cherry Duke (27752), dam (Sarah 2nd) by 2nd Duke of Geneva (21591) 225
41—Socrates, Sept 12, 1872; by Cherry Duke (27752), dam (Sarah) by 2nd Duke of Geneva (21591) 299
42—Jamzary, Dec 1, 1872; by Oxford Beau (29485), dam (Judith) by Cherry Duke (25752).. 225

Summary.

31 Cows and Heifers	$1,118 00	$34,660
10 Bulls	857 00	8,573
Total of sale		$43,233
Average of 41 Head		$ 1,054

The sale of Col. Towneley's far-famed herd of Short-horns came off on the 1st May, as advertised, at Towneley Park, Burnley, England. The prices got were as follows:—

Cows and Heifers.

1—British Beauty, Dec. 22, 1858 $420
2—Duchess of Lancaster 2d, January 9, 1856.. 546
3—Frederick's Pride, April, 1859 236
4—Cheerful, April, '62 315
5—Duchess of Towneley, Feb., 1864. 546
6—Duchess of Lancaster 5, March, 1864. 341
7—Duchess Feb., 1865 420
8—Butterfly's Wing, 1865 291
9—Lady Butterfly 2d, March, 1866 294
10—6th Maid of Oxford, June, 1866..... 4,200
11—Towneley Butterfly, July, 1866..... 1,050
12—Duchess of Lancaster 7th, Jan., 1867... 320
13—Waterloo 34th, May, 1867..... 761
14—Moth's Wing, June, 1867..... 273
15—Grand Duke's Butterfly, Feb. 1868..... 1,312
16—Puff, August, 1868..... 325
17—Lady Hudson, August, 1869..... 236
18—Gipsy Gwynne, July, 1869..... 971
19—Baron Oxford's Duchess, August, 1869..... 920
20—Butterfly's Memento 2nd, August, 1870.... 577
21—Oxford Beauty, Dec., 1870..... 1,050
22—Duchess 11th, January, 1871..... 656
23—Butterfly's Memento 4th, Feb., 187..1.... 320
24—Oxford's Duty, July, 1871..... 840
25—Oxford's B. Fly, Feb'y, 1872..... 383
26—Duchess 13th, January, 1872..... 373
27—Oxford Beauty 2d, July, 1872..... 1,312
28—Oxford's Memento, July, 1872..... 346
29—O B's Justicia, July, 1872..... 866
30—A. Gwynne, Sept., 1872..... 735
31—Oxford's Baroness, August, 1872..... 367
32—Towneley Butterfly 2nd, Dec., 1872..... 404
33—Butterfly's Memento, 5th, Jan., 1873..... 184
34—Duchess 14th, Jan'y, 1873..... 168
35—Butterfly's Memento 6th, March, 1873..... 178
Red Calf from Lot 5 420

Bulls.

36—Baron Oxford, April, 1865.....1,312
37—Kenelm Butterfly, Dec., 1870:..... 341
38—Royal Baronet, April, 1872..... 168
39—Thorndale's Butterfly, Nov., 1872..... 184
40—Earl of Towneley, Jan'y, 1873..... 236

Summary.

35 Cows at av. $656 25.....	$22,968 75
5 Bulls " " 448 35.....	2,241 75
Total for 40 Head.....	$25,210 50

Mr. Jilks on the Pork Question.

I was down to a sale a short time ago, and after all the ole pots and kettles, an' krokery, and trumpery, an' ole harness had been sold off, the crowd surged down to the pen to help git in the hogs; yere, they cum across the field, a dozen boys a 'hollerin', as many dogs a yelpin', and it a race between the dogs and hogs—there's one thing, Mistur Edtur, that can be said about the native hog: he's got good wind- and when they got 'em in, the hogs showed their education and instinct by beginning an inspection of the fences, to see where the weak spot was; it looked so intelligent. Some of the critters looked puty good, and finally one was put up which was recommended as "'ported stock, improved breed." Ole Kemp Saxter, a bar-room veteran, who hadn't paid any axes fur twenty years, and went about doin' other people's work to show how well he could do his own, and how much he knew all about it, was there, and when the proprietor spoke about improved breed, sez he: "that's all in my eye; the breed's in the korn house; if yer want a 'proved breed, boys, pile in the korn an' you'll git it. I've heerd about these 'proved breeds o' hogs fur forty yeer, and mi pinon iz giv' me the korn an' I'll make the breed," and with that the crowd give a laff which appeared to throw all the argument on Kemp's side of the question. I was powerful disgusted to see so much ignorance, and to see the opinion of such a character pass fur authority on any question, let alone such a mighty one as pork that lays the fat on our juvenile ribs in school-boy days, and comforts our declining yeers with flapjacks and sausages. Its kind a impulsive with me to take the right side, ef I'm the only one to do it. I jumped up into an ole feed box, and sez I "do you mean to say there's nothin' in the breed ov a hog to make um fat easier? do you attempt to nullify by a single assertion the experience of every man that ever owned a hog, and was intellectually qualified to eat him?" This 'peared to silence ole Kemp, and bring the crowd a little on mi side.—Did you ever notice Mistur Edtur, how quickly the tide of battle changes when the bright blade of a champion of truth flashes in the combat? There's allers plenty to do right ef you can find a man fit to lead 'em; an' I giv it to 'em agin; "don't you always see a difference in the same litter of hogs" sez I; "isn't there allers one or two that beat all the others, and isn't there always a difference in yer tobacco, and don't you turn out the biggest and finest heads for seed, and isn't there always a difference in cabbages, and don't you set out the best stalks fur seed, and don't you pick out the best calves, and everything else to raise from, and why not do the same with hogs, I'd like to know? Well that's jes what has been done; the men that git up these new breeds pick out the best, and breed from them, and then pick out the best and breed again, and finally they so fasten peculiarities upon the race that it will perpetuate those good qualities, and the farmer that shuts his eyes to the improvement which has been effected in animals, and everything else relating to his calling, will back down from the front rank, and by and by work fur somebody smarter than he is, fur you might as well try to raise good wheat from sickly, smutty, worm-eaten seed, or good cabbages, or anything else from the worst possible seed you can find, as expect to have hog-stock that'll pay from the helve-legged, cat-hammed, quill-bellied bottle-snouted bar-sheaves we've got around the country so plenty," and I got down, while the fellers hollered, "give it to 'im Jilks," as though they'd always thought so too, and when I looked for ole Kemp I seen 'im behind the 'bakker house, with his elbow higher than his head, taking sumthing; that was *his* argument.

Now, I am under the impression the average of the hogs killed in our section is much less than 200 pounds: we feed an animal through the fall, winter, spring, summer, fall, and part ov the winter again, and get two hundred pounds of dressed pig, let us see if there isn't sumthing in the breed.

I have in my mind a killing on the old homestead of eight-month pigs which ranged from 245 to 265 pounds per pig.

I have in my mind another killing in the fall of late spring pigs that averaged over two hundred pounds. And here's one of a pure bred Essex that dressed 590 pounds, and another, same breed, 400 pounds, and a Berkshire, 526 pounds, and—note well—only six or eight per cent. of offal, for when you put 500 pounds of one of those hogs away you've got 20 or 30 per cent. more meat than in the same weight of the native trotting stock, and if I remember rightly one of Mr. Harris's killings averaged over 400 lbs., and didn't Col Bowie write some time ago about the Poland or Magie breed, that would dress 1000 pounds? If we git a cow that'll go 600, the neighborhood *Herald* comes out with largo type, leaded and displayed to announce the fact. Nothin in the breed! It's a great pity the legislature don't prohibit the keeping of scrub stock, and we would soon see that *there's everything in the breed*, and a few farmers could club together, buy a boar, and put away more meat in the fall from Spring pigs, than they now do from 15 and 18 months hogs, saving 8 or 10 months keep of the animals, and two or three sows wintered over would be enough for most farmers, and I bleeve farmers'll get their eyes open after a while.—*Maryland Farmer.*

Rabbit Breeding.

In England, but particularly in Belgium and Holland, particular attention is given to the breeding of rabbits as an article of cheap meat food, and immense numbers are annually bred for that purpose. There are in this as in the growing of most domestic animals, certain fancy breeders who breed for the sake of producing new and strange types of the animal, as the lop-eared rabbits, etc. There is no advantage in the lop-ears, except the higher price they bring as fancy animals. One fact is noted as regards the flavor of the wild and tame animal, that while domestication increased the size of the animal and the disposition to sport, both in color and form, the quality of the meat is not considered as good as the wild. Hence preference is generally given to the meat of the wild over the pampered animal; though doubtless the food has much to do in determining the quality of the meat.

In regard to the enormous fecundity of the tame rabbit, the *Aigle du Midi* states that: "A farmer named Pinel, of Revel, in the department of the Haute-Garonne, France, has lately commenced breeding rabbits on an extensive scale for consumption, and that he expects the operation to be successful in a commercial point of view. In the space of five months, from May last, he, with fifty female and five male rabbits, obtained 1,300 young, and he now intends to have 200 females. By allowing these latter to produce only every two months, instead of every month, as they can do, he calculates that he can procure 500 rabbits a month, or 6,000 a year. He has had constructed a large shed, 30 yards long by 20 wide and 40 feet high, and in it are 140 compartments, of which 10 are set apart for young rabbits separated from their dams, 14 for the adults, 12 for the males, and the rest for the doe rabbits and other purposes. Pinel makes this calculation: Out of 270 rabbits born every month, the average number of deaths is 12, so that there remain for sale 258 which can be disposed of for 12 cents each, making $30.76, or $681.12 a year. This sum is increased to $931 by the sale of the manure. The expense of producing 258 rabbits is estimated at $274, so that a clear profit remains of $657. As rabbits can be fed in great part on the refuse of the farm-house and farm-yard, it is thought that they might in many localities be bred to advantage."—*Ex.*

Barrenness in Mares.

I have a large fine mare from which I wish to get a colt. Last year she was taken to *Mambrino*, who served her some half dozen times, I believe, during the season, but without any issue. I wish to take her this year to him again, and I want to know whether anything can be done more than the horse's services, to insure her being with foal. I have owned the mare two years. I suppose she is twelve years old, perhaps more, and I judge she may have bred before.—P. B. M., *Baden Mo. Remarks.*—Some mares are incurably barren. Sometimes they will fail for years in succession, and then again take to breeding. Various expedients have been resorted to in such cases; and one which is oftener successful than the other is to *reduce* the mare by steady, hard work to a low state of flesh; then when you wish to breed her, let up on the work, give her plenty of nutritious, but not heating food, and when she is in a thriving condition let her have the horse. It is claimed by many old horsemen, that where mares have been kept very fat, there often occurs a closing up of the womb, which precludes impregnation, and which can only be remedied by an "opening of the womb" by the hand.—Sometimes there is a laceration of the womb in foaling, and the same closing up ensues. We have seen this "opening up" process resorted to in a few cases, and usually, but not always, with success. Some cases are recorded of mares that were pronounced hopelessly barren becoming impregnated by permitting the horse to serve the mare, and then turning them loose together in a lot, or large box-stall, allowing the horse to tease the mare at his leisure, until he serves her again of his own accord. The mare should be kept quiet for a few days, after service, in a roomy stall, away from the horse.—*National Live-Stock Journal.*

Suint.

In nothing is the spirit of the age more clearly shown than in the efforts to utilize waste substances. Quite a recent instance of this improved economy is found in the treatment of the wool of sheep. It has been ascertained that sheep derive from the soil upon which they pasture a considerable amount of potash, which, after it has circulated in the blood, is excreted from the skin with the sweat, and remains, generally in connection with this, attached to the wool. Chevreul discovered, some time ago, that this peculiar mixture, known by the French as suint, constitutes not less than one-third the weight of the raw merino fleece, from which it is easily removed by immersion in cold water. In ordinary wools the suint is less, the amount being about 15 per cent. of the raw fleece. Formerly it was considered as a kind of soap, mainly for the reason that the wool, besides this, sometimes contained about 8 per cent., or a not inconsiderable quantity of fat. This fat, however, is usually combined with earthy matters, mostly with lime, and consequently forms a soap which is very insoluble. The soluble suint is a neutral salt arising from the combination of potash with a peculiar animal acid, of which little more is known than that it contains saltpetre. Special effort has lately been directed to suint, in order to obtain as much as possible of the potash eliminated from the animal, and a special industry has been established in various portions of the great French wool district, such as Rheims, El Bœuf, &c. A company purchases from the wool raiser the solution of the suint obtained by rinsing the wool in cold water, the price paid for it being higher in proportion as it is more concentrated. As a general thing it is maintained that a fleece weighing 9 pounds contains about 20 ounces of suint, which should contain about one-third part, or six or seven ounces of potash, although not more than five and one-half ounces are perhaps directly available.

In the wool manufactories of the towns just referred to, there are nearly 60,000,000 pounds of wool washed annually, the yield of about 6,750,000, sheep. This quantity should contain over 3,000,000 pounds of pure potash. Thus, the water in which the wool is washed, and which has been heretofore thrown away, is made to yield a product, adding appreciably to the value of the wool itself, and more than covering the cost of its treatment. It is, of course, not an easy matter to utilize this solution of suint on a small scale; but wherever the work is carried on by the wholesale, as it is in connection with all great manufacturing establishments, it will undoubtedly become a regular part of the process of manufacture.—*London Chemical News.*

A Pedigree Not All.

There is no breed of animals in which there are not differences in the value of different animals—none in which some animals unfit for use as breeding animals cannot be found. The fact that an animal has a pedigree showing that it is "pure bred," does not prove it is a good animal. Breeders owe it to their future reputation, if not to the public, to "weed out" inferior animals from their herds or flocks—sending them to the butcher's shops rather than selling them for breeding purposes. Purchasers should exercise common sense enough to look for individual excellence as well as pedigree. This is no argument against pedigrees or pure breeding. Pedigrees are valuable. Of two animals of equal individual excellence, the one known to be descended from ancestors also noted for individual excellence, and the other with nothing knowing of its ancestry—the first is decidedly the more valuable for breeding. A good pedigree will out-weigh some defects, for the offspring may resemble the better ancestors, but no pedigree is good enough to make it advisable to breed from an animal worthless in himself.—*Ex.*

SWINE.—Let pigs of all ages have access to a mixture of ashes, salt, and sulphur. Keep the pens and troughs clean. Let them have a dry, warm well-ventilated place to sleep in. Do not put too many in a pen. Keep the younger and weaker separate from the older and stronger. Feed according to what the pigs are designed for.

Lameness of pigs and loss of the use of the hind legs is believed by a correspondent of the *N. E. Farmer*, to be a species of founder caused by highly concentrated or oily food, such as corn meal or milk in large quantities, and which he has cured by bleeding—by cutting off the end of the tail, repeating the operation two or three times if necessary. He has never known it to fail to cure.

SHORT-LEGGED STOCK.—Do farmers know short legged stock is the best—short-legged cattle, short-legged horses, short-legged sheep and hogs? Do they know that all short-legged animals have greater depth of rib, of body, more strength and vitality and better constitution than long-legged animals? In breeding this should be remembered. Short legged bulls, stallions, boars and bucks are always best, other things being equal. A good judge of animals will always pay more for them. Eschew long-legged stock. Breed to the best always. Like will beget like.—*Ex.*

The Dairy.

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

Butter.

In the dietary of all the civilized nations of the globe, butter holds a high place. With the cultivated and refined it is everywhere recognized as one of the crowning luxuries of a perfect meal. The tables of wealth and refinement are never complete without it. Its absence would create a void that nothing would fill. But it is the *perfect* article that takes this strong hold of the appetites of men. The *imperfect* article is despised. Nothing could be more indicative of the esteem in which the extremes are held than the terms used to designate them. "gilt edged" and "grease" Commercially it assumes large proportions It is an article of extensive traffic, and interests everybody, for every family either makes or buys it. An article in such general use and general esteem ought to be so well understood as to ensure in all respects, perfection in its manufacture, so that nothing but a perfect article would ever be sent from any farmer's home. There is the greater necessity for this, since its commercial value depends upon the extent to which the palate is pleased But experience does not run in this direction. Perfection is the exception instead of the rule, and it is not very strange that it is so, for the art of butter-making is an intricate operation Its success depends upon a succession of little acts, each one of which is liable, when not performed aright, to alter the whole character of the production. The correct performance of all these little acts involves an aquaintance with the properties of milk which the present extent of practical and scientific knowledge renders it difficult to acquire. With a view of helping to familiarize some of those items, we invite attention to-day to some of the

Changes that Occur in Milk.

Milk is an unstable compound. It is constantly undergoing changes from the time it is formed in the lacteal glands, till it is manufactured or consumed. The moment it is secreted by the milk glands, and passed into the tube of the udder, it is attacked by thousands of busy absorbents, that begin at once to suck up, and carry away into the general circulation the nutrient properties it contains. Milk 12 hours in the udder is a very different thing from milk when first secreted. Exposed to the action of the absorbents that line the milk tubes, it steadily loses as it passes along, a portion of its fat, its albuminoids, its sugar and water, and, probably, also a portion of its saline ingredients But the watery solution of saline matter that forms a part of the milk, is the last to be taken up. The difference between the milk first and last drawn is due to the action of these absorbents. It is generally supposed that this difference occurs from the rising of the cream while in the cow's bag, but this is evidently an error. There is no evidence of motion in the milk within the passages of the udder, other than that of crowding along from the ramifications of the lacteal glands toward the teats. The valves in these opening downwards, forbid any other action. If an upward motion were possible, the swinging and thumping of a full bag against the cow's legs would keep it so stirred up and mixed as to make it all alike. Milk that has stood 12 hours in the bottom of a deep vessel is quite different from that which has stood in the teat the same length of time. If the supposition that cream rises in the udder the same as in an open vessel, were true, we should find in woman's milk the reverse of what we do in cow's. The heaviest and poorest milk would settle to the bottom of the breast, and be drawn last. But it exhibits the same phenomenon that cow's milk does, the richest being the last drawn. We have tried milking once, twice, three times and five times a day, and the last number produced the best milk The milk of a cow that yielded thirteen per cent of cream when milked once in twelve hours, averaged seventeen and a half per cent. when milked once in three hours, and the latter had the higher color. Frequent and regular milking is necessary to the best results in butter-making The practice of milking once a day, as some people do when the mess is small, very much injures the quality of the milk. When the flow of milk is large, it will be found a paying operation, especially with parties having a few cows near the house, to milk them three times a day. The milk will not only be richer, but it will be increased in quantity, and will have a more delicious flavor.

Changes that occur after Milking.

When relieved from the action of absorbents within the udder and brought into contact with the air, other agencies begin at once to act upon it, inducing the changes which afterward occur. Unstable as milk appears to be, it does not perish from anything in the nature of its own elements, but is destroyed by influences foreign to its own necessary composition. Milk does not sour, as is generally supposed, of its own accord, nor yet from the direct action of the air upon it. It absorbs from the atmosphere the seeds of a fungus plant, which grow and multiply and fill the milk with their presence, and produce the souring. The seeds of the fungus that are concerned in the process of souring are very small, and are always floating in the air unseen and unsuspected. When developed into the full grown plant, they are of considerable size, so that they are readily seen with a magnifier of moderate power. They are shown at the bottom of the annexed figure, as they appear under a microscope with a magnifying power of 1000 diameters.

They have a distinct cylindrical form, and are known as *arthrococcus* or jointed cells. Cold checks their growth, but never kills them. They are not injured at all by freezing and thawing, or wetting and drying. Nothing but heat kills them. One of these cells adhering to the sides of a milk pan, or in a crevice, may be dried in the most thorough manner possible, and lie there for a week, a month, or even a year, without injuring it in the least. The moment it is moistened with warm milk, it swells up and springs into active growth, and in a short time its progeny may be counted by the million, and premature souring is the result. They grow most efficiently at blood heat, and nothing short of a boiling heat, is sure to kill them.

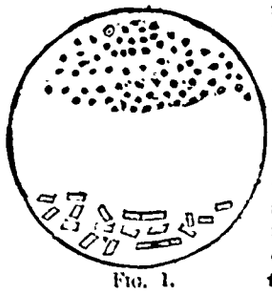


FIG. 1.

A few destructive agencies get into milk through the body of the cow. One of these is represented by the dots in the upper part of Figure 1. They are callled *Micrococus* cells. They are exceedingly minute, and everywhere abundant. Their influence tends to produce decomposition. They are also active agents in digestion and in the coagulation of milk, and in putrefaction. They do no particular injury to milk unless kept too long, when they produce offensive putrefaction. They are killed with a boiling heat. It is to kill these destructive agents, that we scald green fruit, and seal it up air tight while hot, to shut them away from it They may be killed in milk in the same manner, and if they are effectually shut out by sealing up air tight while hot, milk or sweet cream will keep just as well as canned fruit, and for precisely the same reason, as we have found by experience.

Other and more detrimental agencies, in the form of organic germs, sometimes get into milk through the food and drink, or breath of the cows. Figure 2 shows some that got into the milk through bad water which the cows drank. They consist of two species or of microscopic *algæ*, as often called "frog spittle."

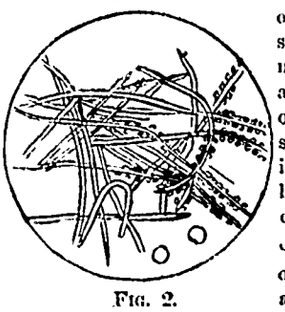


FIG. 2.

They were not seen in the milk when first drawn, but, after standing a while, they grew from the seeds contained in the milk, and developed into visible plants. They affected the health of the cows, producing slight fever, and the milk had all the peculiarities of what factory men call "tainted milk."

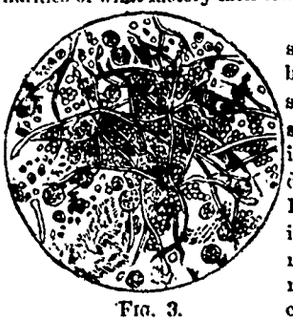


FIG. 3.

Figure 3 shows some that came in by feeding distillers' slops. It shows a sample of the milk illustrated in this department, May, 15th. Fig. 4, and illustrates the growth made in 24 hours, the milk being closely cooked. The organisms were in immense numbers. Every drop of milk contained from 5,000 to 10,000 of the full grown plants.

We have seen illustrations of the milk derived from brewers' slops, that showed distinctly the form of fungus peculiar to brewers' yeast.

These illustrations admonish us of the necessity of looking well to the food and drink of our dairy cattle, as the occasion of deleterious changes produced in milk. It is true that all the noxious agencies thus introduced, may be destroyed by scalding the milk when freshly drawn. But it is not always convenient or desirable to scald milk, besides, it is much better to keep them out than to kill them, and leave them in. But the most serious source of difficulty with the butter dairyman arises from the

Absorbent Properties of Milk.

It is a fact that cannot be too strongly impressed upon the mind of every one connected with the manufacture of butter, that milk takes in every odor, and the seeds of every ferment that blows over its surface. This absorbent power is not peculiar to milk alone. It belongs in common to all liquids. Water placed in a cellar containing decaying vegetation, soon tastes and smells of the decay, and becomes unwholesome to use. But milk being full of oily matter and holding albuminoids, and sugar in solution, offers to every species of ferment just what is most desirable for it to flourish in. Every odor that comes in contact with milk is grasped and taken in at once, and its grasp is never slackened. Once taken in, it is there permanently, and the seeds of every ferment that touches its surface finds such a fertile soil to flourish in, that they spring at once into vigorous growth, and multiply and quickly "leaven the whole lump." The *London Milk Journal*, cites instances where milk that has stood a short time in the presence of persons sick with typhoid fever, or

been handled by parties before fully recovered from the small pox, has spread those diseases as effectually as if the persons themselves had been present. Scarlatina, measles and other contagious diseases have been spread in the same way. The peculiar smell of a cellar is indelibly impressed upon all the butter made from the milk standing in it. A few puffs from a pipe or a cigar will scent all the milk in the room, and a smoking lamp will soon do the same. A pail of milk standing ten minutes where it will take the scent of a strong smelling stable, or any other offensive odor, will imbibe a taint that will never leave it. A maker of gilt-edged butter objects to cooling warm milk in the room where his milk stands for the cream to rise, because he says the odor escaping from the new milk while cooling, is taken in by the other milk, and retained to the injury of his butter. This may seem like descending to little things, but it must be remembered that it is the sum of such little things that determines whether the products of the dairy are to be sold as grease, or a high priced luxury. If milk is to be converted into an article of the latter class, it must not only be derived from healthy cows fed on food free from objectionable taints and qualities, but it must be handled and kept in clean and sweet vessels, and must stand in pure fresh air, such as would be desirable and healthy for people to breathe.

Other Changes.

Many other changes than those enumerated, occur in the milk room. Light and air act upon the particles of cream, giving them increased color. The souring process once begun, continues till the sugar is converted into acid. The whey begins to separate from the thickened milk and the vinous fermentation sets in, and slowly forms alcohol, which takes up at first the more volatile oils, and afterwards preys upon the solid fats to the detriment of the quality and quantity of the butter. If still permitted to stand, the alcohol is converted into vinegar, aggravating results.

While these changes are going on, the *micrococus* cells will be slowly decomposing the cheesy matter, converting some of it into fat, and carrying it on to putrefaction.

These are some of the changes which are ever progressing under the eye of the dairyman, and he who can most successfully direct and control them is the one who reaps the best reward.

How to Manage a Kicking Cow.

A "KICKING COW" is regarded by most dairymen as a great nuisance. Not unfrequently some of the best milkers in the herd show this bad habit, and it is safe to say that vast losses, in aggregate, are sustained every year, which may be traced directly, or indirectly to this fault. In most instances the habit comes from an improper manner in which the cow, when a heifer, was broken to milk, or from some bad management of the milker after the animal has grown older. Cows of a highly nervous temperament will, not unfrequently, become confirmed kickers, from the rough and careless manner in which the milker handles the udder and teats while milking. Any rough or careless handling of the udder, when filled with milk, is more or less painful to the animal, and a kick may be given, not from any viciousness or ill temper, but is simply an involuntary motion of the foot to relieve pain. If one standing near a hot stove should by chance get his hand on the hot iron, he will be likely to draw it away with a quick involuntary movement, and might possibly give a person standing within range a smart blow, though, of course, such a stroke would be wholly unintentional. We once saw a person severely injured in the eye from a stroke of the elbow under such circumstances, but it would be very unjust and unreasonable for the injured person to fall upon and cruelly beat and kick the offending party. And yet cows are not unfrequently treated in the most brutal manner for some trivial inadvertence—perhaps the involuntarily raising of a foot to escape pain, caused by a rough milker pressing his sharp nails into the teats, or wringing and pinching them in an improper manner.

It is true there are vicious and bad-tempered cows, which will take every occasion to cause trouble, but we doubt whether they are improved by whipping—certainly not by beating—and it should be a rule with every dairyman never to have a cow struck for any fault while being milked. These remarks, we think, are especially opportune at this season of the year when the work of the dairy is about to begin. A kick with a heavy boot, a stroke of a stool upon the back, given to a cow; may destroy her usefulness for the season, and, perhaps, permanently injure her, while in any event the temper of the animal will not be improved. What then is to be done with kicking cows? Are they to be left without milking, or shall they be allowed to use their feet upon the milkers, endangering life and limb, and tramping the pail and milk in the dust? We reply, none of this need be permitted, if the dairyman will apply his science to the case, and overcome these faults by devices of the intellect rather than brute force.

We have seen various plans recommended for preventing cows from kicking, such as tying the hind legs, strapping up the fore leg, etc., all of which are, more or less, open to objection, on account of the time and trouble required. The most simple, as well as the most effectual, remedy for kicking cows is that employed by some of the dairymen of Herkimer County. It consists of buckling a leather strap rather snugly about the body of the cow, just in front of the udder. The cow is then rendered powerless to do harm in kicking and the most confirmed and viciously inclined kickers are at once subdued. Those who have employed this simple method say that in no instance in their experience, has it failed, and we give it here as a valuable adjunct to dairy management. We hope those of our readers who have kicking cows to milk will try this device, in the hope that it will save the milkers from being floored, save milk from being wasted, save the poor brutes from much mauling and beating, and, in fine, save an outburst of temper in both man and beast. In conclusion, we say, treat all domestic animals kindly; and this rule must be imperatively observed with the cow, if she is expected to do her best at the milk pail.—*Rural New Yorker.*

Water as a Preserver of Butter.

After being duly packed water-tight, the packages may be placed in good cold wholesome water, such as is found in good wells and springs anywhere. Any such good well of water may be used for this purpose only be sure the package is completely under water always; and if under water several feet deep, it is no detriment, but probably an advantage. It is not necessary, but probably best, that the packages should not rest on the clean ground at the bottom of the well – not that any harm would happen to the butter but the outside of the package might get soiled and muddy. A deep tank, kept full of water from a flowing spring and continually flowing, may be the most desirable reservoir for keeping the butter in, if the tank is well-covered and kept from freezing. The best way to feed such a tank is to let the feed pipe pass down in the tank to the bottom, and the surplus water pass over its top, so as to keep a motion in the water all the time and change the water in the tank continually. Any well used for the purpose should be one from which water is taken liberally every day, so that the water may never become stagnant. No one need be surprised if butter stored in this way may be kept for years as good as when packed. Possibly lard and some other articles of food, as well as all canned articles, may be stored in this way advantageously.—*Exchange*

Top-Dressing Grass Lands.

I think most of our farmers make a very great mistake in neglecting to top-dress their mowing lands. No crop except hay is allowed to remain year after year to shift for itself without cultivation; but this, because it will yield a fair compensation for the labor of harvesting for several years, is neglected. Any old field in which there are plenty of grass-roots can be made to bear its two tons of hay to the acre at an expense which is trifling in proportion to the gain realized. Top-dressing not only serves to increase the productiveness of the soil by adding to its fertility but it also serves to protect the roots and young shoots from the hot sun and the frosts. I have noticed when an old worn out field was ploughed, that around the edge of the ploughed part, where a portion of the earth, no richer than the rest, was thrown out upon the grass, it grew tall and rank, while small and apparently "run out" all around. This led me to make some experiments, and though they were imperfect, and no accurate record of them was kept, I satisfied myself that a top-dressing of earth exactly similar to that of the field, spread upon worn-out grass land, will greatly increase the crop. A load of horse manure spread upon a piece of dry, mellow soil with a good sod, had no visible effect, while muck, ashes, and common earth, showed their effects plainly the first year. My theory is that a top-dressing, even though it contains no fertilizing material, largely benefits the crop by protecting the grass roots from the hard freezes of autumn and spring, and from the scorching summer sun. There are three periods in the year when I would apply well-rotted manure, ashes, muck, or earth to mowing lands (and I believe it would pay to top-dress the whole once every year); first, early in the spring, after the frost has thrown up many of the roots and exposed them to the weather; second, immediately after haying, when the generous shield of verdure has been removed, and the sun's rays are scorching the life out of the plants which have already received so severe a check to their thrift by being cut off; third, in the fall, when there is generally more leisure, and the coating thus given will be available in the spring.—W. H. W., *in Vermont Farmer.*

Farmers' Difficulties in the United States.

For a number of months past we have had from many pens, delineations of the difficulties and disadvantages of the farmers of Maine, with the anxious inquiry, "What shall we do?" I am not inclined to treat these difficulties as altogether imaginary, or these inquiries as inappropriate; and yet I cannot resist the impression that much of this alarm is unfounded, and the difficulties over estimated.

There is evidently something more than used to be the case operating as a drawback on the farmer's prosperity– a something that abstracts the money from the farmer's keeping, leaving him as lean as in former times, notwithstanding he has received far more for his crops. Taxation has heretofore operated in this direction to a great extent. Though there still remains enough of this to be much felt, this is not quite enough to account for the whole difficulty. The exactions of fashion and the customs of society constitute a greater tax than those laid by our municipalities. During the war much money was made, and since has been unusually plenty. This has induced habits of living and social customs incompatible with the real income of the people. The rural population has seen others, in government employ, or in speculation, or in various easy pursuits, apparently getting rich, or living at their ease; and there has been a desire to enjoy their privileges and copy their habits. Even the laudable desire of the farming community to rise in the social scale has been misdirected into aping the fashions and follies of those around them. Men do not labor so hard as formerly, and do not manage so carefully. There is an avoidance of the disagreeables of our business and a shirking of much that should be done. Said a business man to me the other day, "Years ago, when I went around the country buying cattle, I would find the farmers and their boys out with sturdy four-ox teams, ploughing, clearing, or building stone wall. Now I don't see much of this. Look around the village here, and you will see plenty of young men dressed up in clean clothes, loitering around the stores." Here is the difficulty—production is lessened, and the profit of what is produced is expended in keeping up with the times.

But would you have us make slaves of ourselves and families always? Are you not aware that it is the lack of leisure, of education and refinement that is sending our sons away from the farm, and our daughters into other connections? I am aware of all this, and yet I would never allow relaxation in needed diligence and economy, under the false notion that it will conduce to the future respectability or comfort of children or of the farming community. Another thing I would not do. I would not suffer the demands of society to render me so poor that I could not live in comfort, and then wonder what is the matter—lay the blame to the country, or to the markets, and sigh for the far off somewhere where wants are supplied without effort, and perplexities never come. Remember this, that the products competing with ours in the markets are produced by disregarding the luxuries and refinements of life, to a great extent, by those who have wearied of the exactions of refined society, and have gone into those new countries, moved into their sod cabin and worked with a will. And let us know that, if those countries are perfectly equal as to opportunity, we cannot hold our own with them if we carry the burdens of our present customs. It may be inferred from the above that it is my opinion that the most important measure for us is to stop grumbling and go to work.—*Albert Pease in the Maine Farmer.*

Poultry Yard.

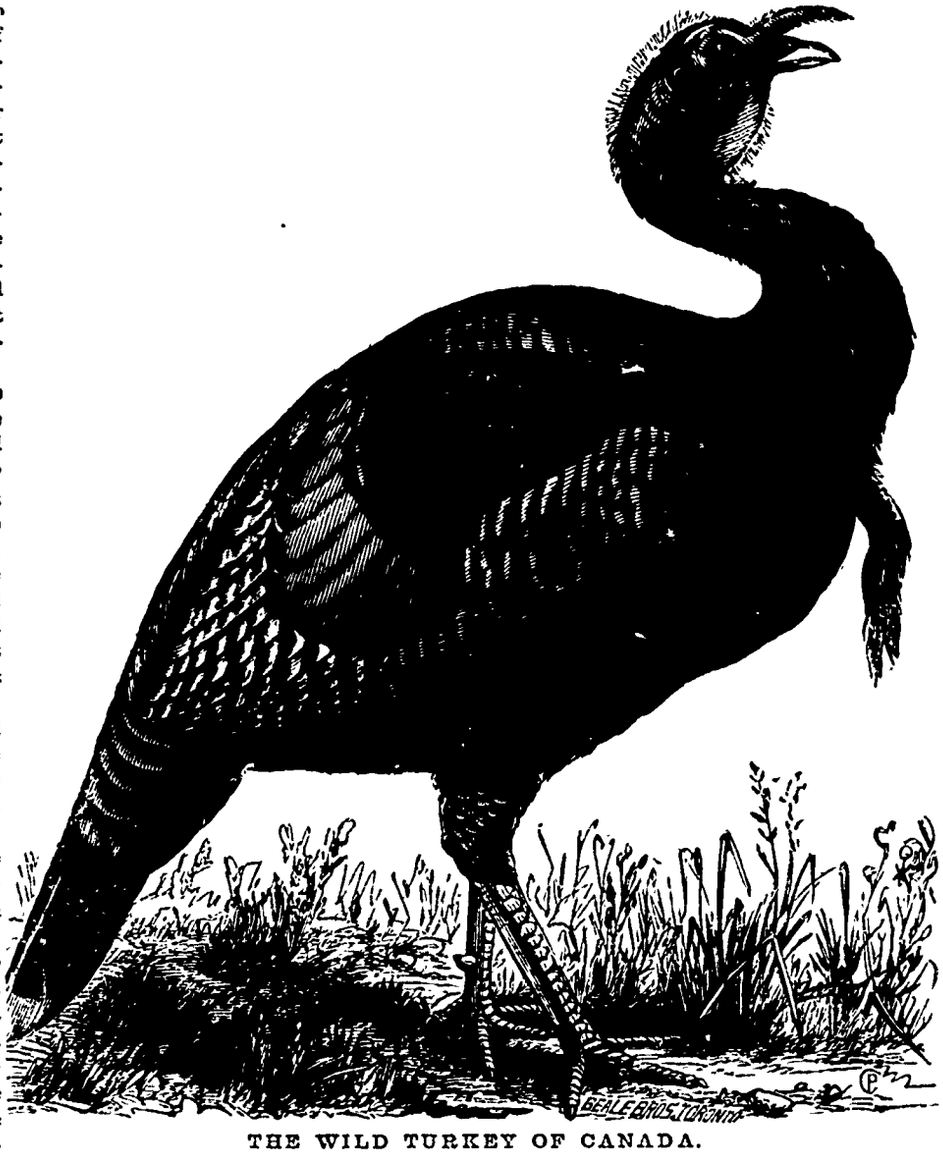
The Wild Turkey.

It has been stated by almost all writers on poultry that the wild turkey is strictly a native of North America, having its range from the Isthmus of Darien, on the south to the fifteenth degree north, and east and west respectively, the Atlantic Ocean and the Rocky Mountains. 'No individual of the species 'says Bement, has been seen south of Panama, and it is utterly unknown beyond Lake Superior.' In size and beauty, it far exceeds the domesticated bird, and those only who have seen the latter bird can form but a very faint idea of the beauty of its wild progenitor, when in a state of nature. Doubts however, have arisen as to whether the wild turkey of North America was the originator of the European domestic species. Tegetmeir says: "If there is one fact more clearly ascertained respecting the turkey than another it is that it is certainly not descended from the common wild American species, as is generally stated by the compilers of the great number of our works on poultry."

The different wild species known to naturalists are three in number—the wild American turkey, common to Canada and the United States; the Mexican species and the ocellated turkey of Honduras. We have in addition the tame bird. The male of the wild American species, when full grown, will measure four feet in length, and nearly five feet in the stretch of its wings. The naked skin of the head and neck is blue, with the wattles red as are also the legs. The feathers of the neck and body generally are a coppery bronze, changing in some lights to a greenish or purplish shade and margined with an opaque line of velvet black. The back and rump are also black, and tipped with a light chesnut. Near the end is a band of black, broadest on the outer feathers, and narrowing as it approaches the central ones. Between the bars on the feathers is a confused sprinkling of black. Neither upon the tail nor its coverts is there any white, and this is one of the means by which the wild birds can always be distinguished from the domesticated. From the centre of the breast hangs a long coarse, hairy tuft, sometimes not found in the other sex. The female differs principally from the male in being smaller in size, less brilliant in coloring, and in the absence of the spur, and a fleshy process at the base of the bill.

The Mexican turkey, for size, exceeds that of the largest specimens of the North American species, but it has shorter legs, a considerably larger and more broadly expanded tail, conspicuously toned with brown and black, and terminated with white; the tail coverts are very profusely developed, largely tipped with white, and bounded, posteriorly, with a narrow line of black, their basal portions being rich metallic bronze. The same arrangement of colouring also prevails on the feathers of the lower part of the flanks; and on the under tail coverts, where it is particularly fine. The centre of the back is black, with greenish purplish, and red reflections; the back of the neck, upper part of the back and shoulders are, in some, light bronzy, in others the color of fire, the greater wing coverts are uniform bronzy brown, forming a conspicuous band across the wings; all the primaries are crossed by mottled bars of blackish brown and white, freckled with brown, all the under surface is fiery copper, intensely brilliant in certain lights, and becoming darker towards the flanks.

The Honduras or ocellated turkey, is a native of Guatemala, the Province of Peten and Yucatan. The extraordinary brilliancy of its plumage renders it almost equal in beauty of coloring to the Impeyan pheasant, which scarcely surpasses it in the metallic lustre of the feathers. In size it is nearly equal to the common turkey. At the base of the upper mandible of the bill is a long fleshy caruncle, capable of contraction and dilation as the bird is excited or tranquil. The head and part of the neck are naked and of similar livid color, but without these caruncles or fleshy tubercles on the lower part, which are so characteristic of the common species. On the breast, the tuft of coarse hair that forms so remarkable a feature of the common turkey is absent. The feathers of the upper part of the body are mostly of a brilliant bronzed green, terminated by two bands; the first black, and that next the tip of a golden bronze color. Lower down the back the colors becomes more vivid, and are tinted with emerald green, rich blue, or red, according as the light falls upon them. On the tail the bars or bands become broader and even more brilliant, making each feather appear as if eyed or ocellated; and from the arrangement of the tail coverts there appear four rows of these brilliant metallic eyes. The upper wing coverts are a rich bright chesnut, which strongly contrasts with the white of the feathers of the lower part of the wing. The entire plumage may be described as far more brilliant, varied, and beautiful than that of any other turkey, and its general appearance differs widely from that of the domestic species. This lovely species could it but be naturalized, would be a great ornament to our poultry yards, it has however no claim to the origin of our domestic species.



THE WILD TURKEY OF CANADA.

If the weather is warm as early as the middle of February, the wild turkey begins to experience the impulse of propagation, and just by day-break the forests are filled with the gobblings of the cocks and the responsive cluckings of the hens, which continue through March and April. By the end of April the clucking has almost entirely ceased and the hens are upon their nests, which they keep carefully concealed from the gobblers. Worn out by their amorous duties and incessant battles with their rivals, the gobblers are by this time nearly mute, and now having nothing to fight about, and being weak and thin, wander about by themselves through the summer; so poor indeed that they have given rise to an Indian pro-verb, "As poor as a turkey in summer." The hen generally makes her nest some two or three hundred yards from the edge of the forest in the prairies and never very far from water, which she visits about three times a day. At this time the gobblers seek the thickest part of the forests to hide in, and rarely venture into the open woods. But whenever the cock does so and finds a nest he breaks it up and never neglects to break the skull of all the young chicks he comes across. The chicks when hatched, are very small, and covered with a more hairy covering than the down which young tame turkeys have If the season be dry and insect food abundant they thrive fast, but in wet seasons the young chicks being particularly tender and easily killed by damp and chilly weather, "fare but middling." By October the young birds have become nearly full grown, and able to take care of themselves; the hens have recovered the flesh which they had lost by sitting, and in leading their young in pursuit of myriads of grasshoppers, which swarm on the prairie, and the gobblers having picked up their good position by feeding upon wild fruits, they gradually join their forces and form "gangs" as they are called, often consisting of a hundred individuals or more in each gang. At this season the turkeys wander over a great extent of country in search of food, remaining no longer in one place than the food remains plentiful—they remain in gangs from October until February, when as before stated, the preparations for breeding commence.

General Characteristics of Brahmas.

The correct standard to which both Dark and Light varieties of the Brahmas should be bred to, has been the cause of considerable difference between fanciers of this breed. In both varieties the size, shape and carriage should be precisely alike, as are the different varieties of Cochins, only differing in color. In England the Light variety are not so large as the Dark, in this country they surpass the Dark in many cases, but are not so well shaped, and are coarser in bone. Several English fanciers have recently procured from breeders in the United States birds of the Light variety to cross with their stock birds, the result of which has been a great gain in size, and it only needs judgment in mating and care in rearing to breed them larger than the Dark. A full-grown cock of either breed cannot be regarded as up to exhibition standard if he weighs less than twelve pounds, while hens should weigh eight to ten pounds. Cockerels, six months old, should weigh from seven to nine pounds, and pullets six to eight pounds. These are very good weights, and for all practical purposes are to be preferred to heavier, but they will often be exceeded, and cocks have been known to have reached fifteen, sixteen and in an extreme case even eighteen pounds, while many hens have turned the scale on twelve pounds. There can be no doubt then that the Brahma may be made to attain a greater weight than any other breed, not excepting the Cochin. The head of the cock cannot be too small in proportion to the body. This point is not easy to attain, and is of great value as a sign of high breeding, being generally accompanied by fineness of flesh. the top of the head should be rather wide, with a slight fulness of the eye, but not so much as to cause a cruel or Malay expression. The whole head should be rather short, and well arched; a long head looking mean, and disfiguring many otherwise fine birds. The comb—known as a pea comb—is peculiar, but is simply described as resembling three small combs joined into one, the centre one being higher than the two outside. It is very difficult, in the cock especially, to get this point to perfection. No pure strain ought to breed a solitary comb in which the peculiar triple character is not perfectly distinct; but there is a constant tendency to grow too large or crooked or otherwise mis-shapen comb, which requires to be guarded against like any other fault, if even tolerable symmetry be desired. In a perfect comb, the centre ridge should be absolutely straight, and the whole so low as to be perfectly firm and free from shaking, however quickly the bird moves his head. A comb half an inch in height is preferable, but even three quarters, if straight and well shaped, makes a beautiful comb; above that there is a tendency to getting too large. With regard to the shape of the comb, the original was a uniform rise from the front towards the back, ending in a peak somewhat like the Hamburg, though not so sharp or well defined. The arched comb is now almost everywhere preferred to the peaked, and may be thus described,—after rising for half or two-thirds of its length,—decreases again towards the back, thus forming a kind of arch; this form of comb not only looks better to the eye, but is far more likely to breed well than the other, which has a tendency to grow large each successive generation. Single combed Light Brahmas, once so numerous, are now not to be found in good yards and stand no chance whatever at a show. The comb should be handsomely set above; neat and clean cut nostrils; the beak being rather short, thick at the base, and with rather a decided curve; but not too much curvature or it will be what is termed a hawk-bill, a great blemish, which gives a sinister aspect to the bird. In all the original Brahmas the deaf ears fell below the wattles, and this point was mentioned by early writers as a characteristic of the breed. It is often seen so still, and the perpetuation of this point should be carefully sought, as far as possible. The neck of the cock should be unusually full in the hackle, and as much arched as possible, giving the appearance of stately pride. Just below the head, the hackle should start out with a very convex and clean sweep, making the junction at the head very distinct by an apparent hollow or depression. It should be long, and full enough to flow well over the back and shoulders; and with its full and graceful curve, which is almost peculiar to this breed, and rather reminds an observer of the neck of a spirited horse, adds greatly to the noble carriage and appearance of the bird. The neck may be either rather long or short, according to the general style of the bird all over; each has its beauties and its admirers, and each has contended successfully in the show pen. The neck harmonises best with a square compact body, somewhat resembling the Cochin in character, while a somewhat long neck, well arched, and combined with a proper tail, gives a more commanding and noble appearance. The back should be wide and flat across; but very short, the saddle appearing to take its rise almost from the back of the neck. A round back is a great deformity, and so is want of width, a narrow tail being of very little value. The saddle must be very broad and rise well towards the tail, without which there cannot be true symmetry and proportion. The saddle feathers should be long and abundant, so as to flow well over the points of the wings. The proper tail of the Brahma cock is very peculiar, though it is very rare to see it approaching perfection, the true inside tail should be closed except the two highest feathers. These should be very broad, and lay nearly or quite flat, not too long, and the ends turning outwards each way, and projecting on each side through the curved or sickle feathers. The breast of the cock should be deep, full, broad and rather projecting, the breast-bone being set well down between the thighs. The shoulders should be somewhat prominent, so as to make the back a little hollow between them when the bird stoops, and give a handsome proportion. The wings ought to be of medium size, and well tucked up, so as to make the bird look neat and trim. Disordered flights are a great blemish, and birds with any feathers actually twisted should be disqualified. The thighs should be well covered with fluff, though not quite so loose and downy as in the case of Cochins, and the hocks ought to be entirely and neatly covered with soft curling feathers, but not vulture-hocked. The vulture hock is a great blemish, and none but an unusually good bird should win any prize when thus disfigured, but only stiff feathers projecting so as to form a spur on the limb, are to be so regarded, and soft curling feathers, however plentiful, are only a beauty to be desired. The shanks should be of moderate length, and feathered as heavily as possible down to the ends of both outer and middle toes. Too short shanks in the cock look decidedly bad, but it is rather hard to fail in this respect. The shank feather should "stand out" well, not take a perpendicular direction, else it does not show properly. In hocked birds, both the inner and back toes are generally feathered, and in some instances birds free of this fault have their toes well furnished, while, on the other hand, some heavily feathered birds have the middle toe bare which is not desirable. The thicker the shanks are the better. Very large cocks are generally somewhat long in the leg, which if not too great, is not objectionable, provided it is not, as is frequently the case, associated with too long a back, or other defects in shape.

The shape and carriage of the hen should correspond with that of the cock, allowing for the difference in sex. Her head, in particular, should be as small as possible, this point being of much greater moment in her case, with the same slight fulness of the eye. The head short and well arched, with the back rather short and curved, but not too much so. The neck should always be short, the hackle spreading out very full at the base, and flowing well over the back and shoulders; the back flat, wide and short, as in the cock, with a very broad and ample cushion, resembling somewhat that of the Cochin. There is however this difference, that whereas the cushion of the Cochin rather droops at the extreme end, burying the tail, the cushion of the Brahma rises to the last, the short tail rising nearly upright out to the end, so that the lower feathers of the tail are further behind than the upper. The shoulders should not be too sharp, but very neat; and the wings tightly held to the body, and well tucked into and nearly buried in the cushion above, and the fluff of the thighs below. Breast as broad, deep and full as possible, with the crop low down, and the breast-bone well down between the thighs. The fluff ought to be very abundant, and stand well out, covering the hock precisely as in the cock, a Brahma hen must be short on the leg, a leggy hen is of very little value, either for show or for the breeding yard. In both sexes the shanks should stand as wide apart as possible, any approach to knock-knees being instantly disqualified; and the feet should be rather large, with straight well spread toes.

Winter Management of Poultry.

Mr. C. W. Dickerman tells us in the New England *Homestead*, how he feeds and cares for his hens so as to "make them lay." His winter management is as follows:

I fill several boxes or half barrels with earth before the ground freezes, and keep it where they can have access to it at all times during the winter. I have also had a barrel of air-slacked lime standing for years in the hen coop, and found it an excellent preventive of lice. Further, I have a load of clear sand hauled on my premises just at the edge of winter, and occasionally throw a few shovelfuls into their winter quarters. This gives them the grindstones, without which they cannot digest their grain.

My winter quarters for them are not as large as they ought to be, being only 12 feet square for from 20 to 30 fowls, but they have the yard whenever the snow does not forbid. Instead of cleaning out these quarters weekly or oftener, as it is often recommended in the books, I occasionally throw a few shovels of earth (from the boxes before mentioned) over the droppings. Their quarters are not so warm as I should provide were I to build a house expressly for them, but I have two large windows in the south and east sides (discarded sash from an old house), which gives them all the benefit of the sun's warmth and makes up for considerable lack of battening.

Cold weather is the trying time when most people complain that their hens do not lay. It requires more attention to the fowls to get eggs in the winter than in the summer, but they can be had. Give them sunlight and keep them warm in the first place, and secondly give them varied food.

I feed principally corn through the winter, but vary it with wheat, oats, buckwheat, potatoes and meat scraps. Part of the corn I feed whole, and a part I have cracked and ground into meal. I prefer the cracked. I feed whole grain at night, and the ground in the morning, on the principle that through the long night they need something that will stand by them, that having digested all their night's feed by morning, they need something that they can act upon quickly. For the same reason, in the very coldest weather, when I go out to give them their morning's feed, I carry a basin of warm water from the tea-kettle and wet up their dough with that. It will warm them quickly and make them feel comfortable; an essential, as I have before said, to a supply of eggs. The wheat I feed is screenings, which can be had at any feed store probably.

Mashed potatoes fed warm are just the vegetable food they need, and were I on a farm, I should carefully husband a few bushels of the small potatoes for this purpose.

The meat scraps I buy of the butcher in large cakes, and I believe it is as cheap as corn, while it answers a purpose like that of the bugs and worms of the summer.

A very important part of the egg is the shell; in fact an egg without a shell don't amount to much. And unless the hen has a material for the shell, the other preparations are void. In winter the hen has little chance to secure shell material for herself, and hence it must be furnished her. I have found the simplest way to be this. Occasionally I throw a handful of bones upon the coals, clear them a little, pound them fine and mix them with the feed. If bones are not be had, oyster shells may be served the same way.

The tendency to set is a troublesome one out of its proper place; but this difficulty, which seriously annoys some poultry-keepers, is easily obviated. I have a large covered coop in the yard, into which, as soon as I find a hen inclined to set, I put her with a rooster, feeding her liberally and with a variety of food, shells, bones, etc. A week of this treatment will cure her every time, and usually set her immediately to laying again.

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