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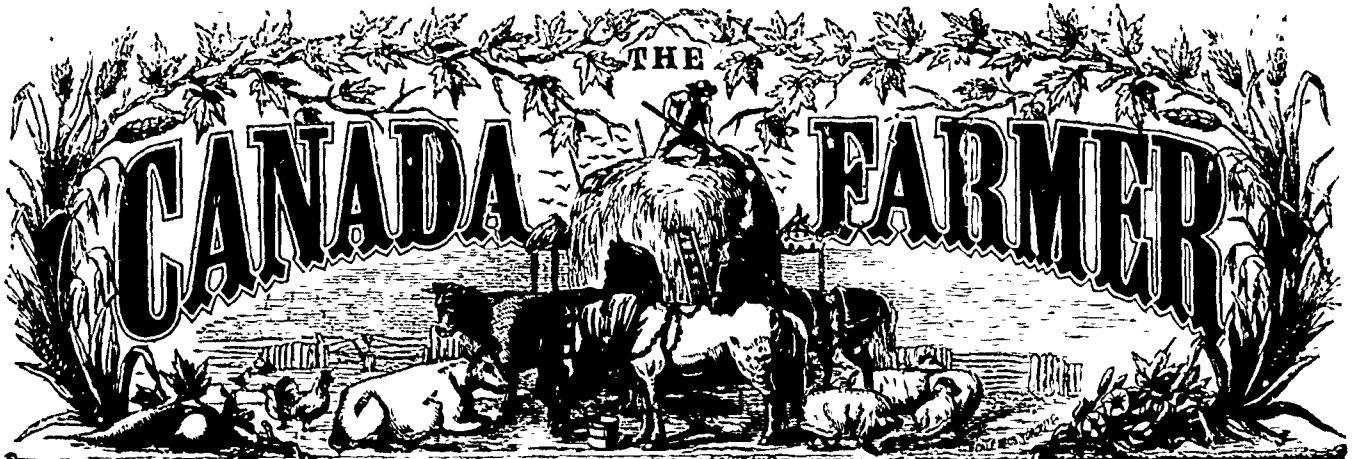
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The Field.

Top-Dressing for Wheat.

R. H. KENTLWORTH, writes us. — I would like to know through your CANADA FARMER what would be the best and cheapest top-manure for fall or spring wheat on heavy, loamy soil. I mean artificial manure, also the best time to apply it."

There are several kinds of artificial manure well adapted to increase the growth of spring or fall wheat when applied in the spring.

SUPER-PHOSPHATE is manufactured in Toronto and can be purchased for about \$40 a ton, but is usually applied in preference to green crops rather than to wheat. It has, however, been often tried and found very beneficial, about 200 lbs. an acre would be considered a good dressing. The only drawback is the cost, when all is charged to the wheat crop; but if grass-seeds are sown with the wheat, the benefit would probably be felt quite as much in the grass crop the following year as the wheat. In reality, therefore, only one-half the expense ought to be charged to the wheat.

NITRATE OF SODA is the best top-dressing for wheat in the spring, but no benefit will be perceptible in the following year's crops. If applied in the fall, but little improvement will be seen the following year, the autumn growth will be somewhat increased, but all benefit seems lost by "autumn rains," "winter thaws," and "spring freshets." The application of nitrate of soda was carefully tested some years since on fall wheat. The nitrate was sown on the wheat, about the beginning or middle of October, stakes were carefully driven in to mark the exact line, and by sowing the nitrate north and south, like a checker board, there were left regular space and interval and close beside these, others, with one cast on them; whilst a little further on where the lines crossed each other, a double portion was used. By using this plan there was also every second line left without any nitrate, and these spaces were sown with salt. But in the spring no benefit could be perceived from the application in any case, over those checkers that had *nothing* applied to them, nor did any improvement appear during the summer or at harvest. These experiments were most carefully conducted. The land was clay loam, and not rich, and perhaps could not be called poor. It seemed as if the winter snow leached out all these soluble manures and they were lost. These experiments were repeated on poor sandy soil in the spring and with excellent results, but the record was not preserved.

These causes of failure could not possibly apply to the use of the manure in the spring, they should be sown in quantities of about 100 lbs. of nitrate of soda and 300 lbs. of salt. They should be mixed well together, and sown broadcast about the end of April

for winter wheat, and about the middle of May for spring. The plants would then be prepared to assimilate this food before any leaching would be likely to materially affect the loss. Nitrate of soda is, worth retail, in Montreal and New York, about six cents per lb. We allude to the agricultural quality, not to the ordinary quality quoted in the prices current.

GRANO would perhaps be the best artificial manure to use, but it is very expensive, very liable to adulteration, and can only be purchased in Canada at retail prices.

AMMONIA has similar objections attending its use. Probably the best and cheapest application for top-dressing wheat in the spring is "plaster," "salt," and "ashes." About two bushels of plaster, four of salt, and six of ashes, would not cost much, and we have no hesitation in saying, it would pay one hundred per cent profit in its application. Some years since we caused some very carefully conducted experiments to be made with this mixture, and with plaster alone, as applied to top-dressing wheat in the spring, and the benefits were very great.

But to succeed well with fall wheat, the wheat must be sown so early as to be sure to escape the rust. The mixture causes so rank a growth that rust will often destroy (in late sown wheat) more than the plaster, salt and ashes will produce. Some objection also exists to forcing the growth of wheat in low, wet places, where it will naturally be rank. But where these difficulties do not exist, and especially where clover is sowed with the wheat, great benefit is almost certain to ensue both to the wheat and clover following.

On the Cultivation of Deep Rooted Plants.

A thorough understanding of this subject is most important to the farmer. Deep rooted plants seem to have the peculiar faculty of increasing the fertility of land, and as such are of vital consequence to the cultivator of the soil—clover, turnips, beets, carrots, parsnips, and other deep rooted plants, by their foliage extract from the air large quantities of nitrogen, and by their roots bring up from the subsoil certain mineral elements, which, without their aid, would continue to slumber far beneath the surface, and either be beyond the reach of grain and ordinary grass crops, or at all events remain in a state unadapted to their use. In addition to this, all the deep rooted plants seem to have a peculiar facility in combining and embodying together the several elements of the earth and the air, and thereby their destruction and decay, either in the soil—in the case of clover roots and other plants of that class—or in the manure gained by the destruction and consumption of turnips, carrots, beets and other matters of a similar nature; they restore these combined elements of earth and air to the soil in such a shape that grain crops can easily and profitably assimilate the elements thus

supplied, and give, as a consequence, far larger and more productive yields than would otherwise be the case.

All these deep rooted plants seem to have two faculties, one by the side and fibrous roots to obtain the benefit of such fertilizing matters as the cultivated soil affords, and which we may suppose goes with the assistance of the leaves and foliage to form the flesh of the roots and plants, the other by their deep tap-roots to abstract from the lower soil such matters as cannot be obtained from the ordinary cultivated surface alone.

The tap-root of all these plants extends far below the plough-gauge of ordinary cultivation. They force themselves into even the hardest subsoils, but do so more easily, as well as more profitably to the farmer, when growing into subsoils which have been loosened by subsoiling. It is quite clear that these tap-roots find something in the subsoil that they want, or they would not penetrate and seek for it. It is not for moisture alone that this penetration takes place, they want, and they get something there in addition to the moisture, which is more important to the growth of the plant and to the profit of the farmer.

Late researches by the growers of the sugar beet have shown that the amount of sugar is far greater in the lower than in the upper portion of the roots, and as the potash and other mineral matters of the root are so absolutely mixed up with the sugar as to be inseparable in the first operations of obtaining the juice, it is not unreasonable to suppose that the mineral matters exist in just as much greater degree in the lower portion of the roots as does the sugar. There may be a scarcity of sugar in the upper portions, but that does not prove that the lower portions do not contain their due quota of salts.

The tap-root of the beet, and also of the turnip, the carrot, parsnip, and all other roots of that class, extend into the soil for at least 18 inches, and it is not too much to suppose that they extend even farther. The office of this tap-root would seem, therefore, to be to bring from the lower soil those elements for which the roots are cultivated, whilst the upper and bulbous portion, assisted by the side roots forms a magazine and store-house, which contains and preserves the constituents of the plants for the purposes of perfecting the future seed. Even the most unobservant must have remarked that the lower end of a carrot is far sweeter and more delicately flavored than the upper—the latter seems to contain the peculiar juices and flavor of the plant, whilst the former (the lower portion) contains the sugar and richness of the root. All these elements are stored in the bulb of the root, and remain unchanged until they are required to form the future seed shoots and seed vessels of the plant by which seeds it is in the future to be propagated.

Professor Voelcker has shown by analysis, that land does not get the full benefit of the mineral elements of the clover root until the autumn of the

second year of the growth of the plant, and when it has been twice mowed, the first time for hay, and the second time for feed. No doubt he is correct so far as analysis goes, but experience seems to show that in every-day farming the land is more benefited by the ploughing under of the crop of growing clover, than by the cutting the two crops (the hay and the seed) and then ploughing in the roots alone with what remains of the crown of the plant. If this is so, it merely shows that the ploughed in crop of clover adds more nitrogen to the soil for the coming crop, and that the root even in its earlier stages affords a large portion of mineral elements as to be of the greatest importance. This effect of the cultivation of deep rooted plants is a matter that requires and deserves to be well thought over by our practical farmers, and adapted to the circumstances of each farm.

The Osier, or Basket Willow.

The cultivation of the willow is very simple. It requires a rich, moist soil, which is not too wet, such as our alluvial bottoms, or the low, damp meadows that lie between hills. A light soil is preferable to one that is too compact, and where the moisture is in excess, the land should be so drained as to carry off the surplus water without leaving the soil too dry.

In preparing the ground for a willow plantation, the first consideration is that it shall be cleared of all underbrush and weeds, and deeply ploughed and well harrowed. When this work is done, the land should be lightly worked off in rows three feet apart and the willow cuttings, which should be 9 inches long and of the last year's growth, should be planted along the rows at a distance of a foot apart. During the first year, in order to give the young willows a vigorous start, the soil should be loosened with the shovel plough and the cultivator, taking care to leave the surface flat at the last working. Any one who knows how to cultivate corn will understand what amount of cultivation is required in an osier plantation during the first season after planting. After the first year, a single hoeing, in May or June to keep down weeds and briars and bushes, will be all that the plantation will require. Some willows may be cut the second year; but it is much better not to touch them until the third season; after which they may be cut annually, with the certainty of an increased product each year.

When the plantation is at its best, two tons of peeled willows to the acre is an average crop. The time of cutting varies. Some cut and strip as soon as the bark will peel freely in early summer; but this plan, though frequently followed, is objectionable, inasmuch as whilst it leaves the season of peeling very short, it also tends to the injury of the plantation. The plan which is more approved in the Northern States, is to cut the willows in the fall of the year, as soon as the leaves are off, and stack them in bundles on the field until winter sets in. They are then hauled off to a low piece of ground, which is capable of being flooded, and set butt downwards. As soon as the spring has fairly opened, the piece of land, which is banked up all round and only occupies a small space, is flooded to the depth of six or eight inches. This flooding starts the sap in the willows, and they are then peeled at leisure. The process of stripping is, however, a tedious operation, and costs ordinarily from two to four cents a pound of dry willow. A Kentucky planter, some time since, in speaking of peeling the willow, said: "When I was a young gardener we used to make a great many baskets, and the best way we knew to get off the bark of the willows was to boil them in some kind of an old pot, it is a very easy way, and very simple." This plan might be improved where the willow is extensively grown. Long troughs, through which hot water or steam could be forced, might do the work of many days scraping, without injury to the willows. Machinery is now used for this purpose, which is said to partly economize the labor of stripping and to do its work well. Of this machine we have no personal knowledge.

In selecting Osiers for planting, care should be taken to choose none but the best varieties. For heavy work where *Populus nigra* is used, Mr. C. Downing recommends 'Parke's' willow, *S. E. Forby*, and. It is very tough and healthy; but when peeled does not whiten well. For general use, he regards the purple willow, *Salix purpurea*, as decidedly the best, although it does not tolerate excess of wetness. Its productive powers are said to be remarkable, and for fine whole work, it is preferred to have no

superior. The next best willow is the long leaved Triandrone willow, *Salix triandra*, which whitens beautifully, is very tough and pliable, and grows vigorously with less drainage than any other of good quality. For split basket work it is a general favorite.

Finally, we say to those who contemplate setting out an Osier plantation, that before doing so it is advisable they should visit the best of those that are already established, so as to glean all the information that is necessary to carry on the plantation economically, and therefore successfully. We have no personal experience as to the profits arising from its cultivation, or manufacture at home or elsewhere. We only presume it pays from the fact that throughout the country a large quantity is raised. A gentleman in the State of Vermont, some years since, stated that he had tried the *Salix Riminali*, and rated the produce the second year after planting (at five cents per pound) at \$750 per acre.—*Maryland Farmer*.

Conquering Canada Thistles.

My neighbor M. owns an excellent farm, in which he takes great pride, seldom ever failing to raise good crops of whatever he plants; doing a hearty share of the work himself, and thoroughly superintending all, there are few things but what are kept in trim order, and we call his the best farm in the district. But the best regulated machinery will go wrong sometimes; a screw gets loose, a cog breaks, or a belt flies and causes temporary derangement. So an atom deranged the usually smoothly-moving machinery of Mr. M's farm. In passing over one of his outlying pasture-fields one day, he came across a few curious looking thistles. Now M. is a man of good intelligence and fair education, but a knowledge of the science of botany was not among his accomplishments, so he did not suspect the real nature of his newly-found pests, but like a careful husbandman, had them grubbed out immediately. Chancing around that way some time later, he was surprised to find his thistles thriving wonderfully and extending their area on all sides. This was attended to by another course of grubbing out, which, however, failed, as the first had done, to more than temporarily arrest their progress, for a week or so found them more thrifty than ever. So the war went on for two seasons, till the patch from the space of a few yards, had extended over somewhere about the fifth of an acre. Meanwhile Mr. M. had found out the true nature of this trouble from a visitor from a region where Canada thistles abound; and thoroughly alarmed, had redoubled his efforts to exterminate them, trying various suggestions from different sources, all to no purpose. On a part of the patch, salt was spread at the rate of over three-hundred bushels to the acre. This, while completely destroying all other vegetation, seemed to scarcely affect the thistles at all. Grubbing them out became a hopeless task, so mowing them off was resorted to to keep them from going to seed, till some means for their destruction could be found, and so thickly had they occupied the ground and so rank was their growth in the rich, deep soil, that great swaths were rolled up in mowing like mounds.

Finally it was suggested that if they could be kept from seeing the light for a season, it would kill them; but the materials for this smothering-out process not being at hand, it was concluded as the next best plan to cultivate the ground so thoroughly that none could grow. So last spring the field was planted with corn, and as soon as the thistles began to make their appearance, the cultivator was started and kept almost constantly going, with a man following with a hoe to clean out such shoots as were missed. Soon a triple hoe was substituted, and more, where the thistles grew several times between each row, forcing the shovels deeply into the earth. This was continued till the corn, which grew very rapidly, was too large, after which hoeing was kept up as often as any thistles showed themselves, throughout the season. And towards the last, after an interval of two weeks, but two or three feeble plants would be found, and Mr. M. feels very certain that next season will finish them with less than half the labor that it took this season.—*Conn. Pen. Telegraph*.

NOTE BY ED. C. F.—There is no cure for Canada thistles like planting an Indian corn crop 3½ feet at least apart, and keeping the cultivator going while one thistle is to be seen. The corn crop will repay the labor, and the thistles will be killed. If any survive, repeat the operation the following year and that will settle the matter.

Evergreens for Rural Improvement.

One of the much needed rural improvements could become universal at small cost to any one family, that is, to plant six evergreen trees around every farm homestead. They may be enclosed with rails for a few years after being planted; when they grow large they will shelter the homestead from cold gusts in winter, give it a lively look all the year, and beautify the country at large. How warm and comely evergreen trees look, when the deciduous species are naked and bare. Turkeys and hens prefer roosting on evergreen trees, to being shut up in filthy coops all night; the branches are arranged to suit fowls to roost upon; there they are sheltered and are beyond the reach of foxes and other animals that prey upon them; they keep free of vermin, enjoy good health, and are generally more profitable. In the heat of summer they get under the trees for shade and the lower branches being near the ground and widely spread out, afford large, shady and airy coops. A good mastiff watch dog will protect the fowls from man thieves in the night time. Farmers should consider how greatly evergreen trees soften the hard and cold winter gusts and tame the force of summer tornadoes, and by the shelter they afford, thereby save animals from sudden chills, and buildings from destruction. Being more dense and massy than deciduous trees, they are doubly valuable for shelter. If farmers grow deciduous trees for summer shade near their buildings, they should grow the large growing fruit trees, apples and cherries. These are at once profitable and beautiful. The species of evergreens are numerous. For every kind of soil, sandy, loamy, and clayey, we have species to suit. In no other country do farm homesteads look so bleak in winter as in America, reminding us of "pelicans in a wilderness and owls in a desert." Farmers rather glory more in the destruction of trees than in growing them. Our wealthy and discerning agriculturists will have to take the lead in thus beautifying their farmsteads with evergreen trees, as they have done in introducing so many superior breeds of domestic animals.—*Practical Farmer*.

Corn in Hills and Drills.

At the Michigan Agricultural College in 1866, two plots of land were set apart, substantially equal in character of soil, each measuring forty-eight rods in width. The ground was ploughed May 3, and manure was spread evenly and worked in by cultivator and harrow. Yellow Dent corn was planted May 21, in rows four feet apart; one of the plots being planted in hills, the other in drills. The plots were cultivated and hoed June 15, and again July 7; the plants being thinned so as to leave the same number of stalks on each plot, including the equal distribution of plants throughout the subdivision of the plots. As nearly as possible, each of the two plots received the same amount of labor and cultivation. The stalks were cut Sept. 17, and stacked in good order; three weeks afterwards the corn was husked and weighed. The stalks then again carefully stacked, and were hauled and weighed, in good condition, Oct. 12. The corn on the portion planted in hills was better in quality than on that planted in drills. But the drilled portion produced seventy-four and one-sixth bushels of shelled corn, and three tons of stalk to the acre, against sixty-five and one-half bushels of shelled corn, and two and two-thirds tons of stalks per acre produced by the portion in hills.—*Rural World*.

Broom Corn.

The Baltimore American Farmer says:—"The land should be prepared as for a common corn crop; and upon this, in proper order, open a furrow with a shovel-plough (or drill will be best, to save labor); let the furrows be three and a half to four feet apart, according to the strength of the land, then sow the seed in the drill, and follow with the plough to cover the seed. In other respects, cultivate as for corn, keeping it clear of weeds. Land rich, or highly-manured, will produce one thousand pounds of the brush to the acre, besides the seed, which is equal to corn, with a little salt thrown upon it, for fattening hogs, and is highly relished by horses and cows. It will furnish more seed or grain than oats.

AUSTRALIAN CORN.—A correspondent of the *Western Farmer*, writing from Baraboo, Wisconsin, says he has found Australian corn one of the best for fodder that he has met with. He had 300 pounds of shelled corn from a quarter of a pound of seed, planted two kernels in a hill four feet apart one way and two feet the other. Many of the stalks had six ears, and none had less than two.

Agricultural Implements.

Horse-Hoes.

The very injurious effects of weeds, as experienced by every practical farmer, render any remarks regarding the necessity of a good horse-hoe needless at this time of day.

Even where there are no weeds, the use of this implement in merely shaking up or scarifying the soil between the ridges of growing plants, cannot be over estimated; for science has now fairly proven that the free admission of the sun's rays and of atmospheric air is almost as essential to a healthy growth as the soil itself.

There are various implements of this class already in use in Canada, generally, or with few exceptions, on a limited and somewhat cheap scale, and although each of these appears to answer its purpose pretty well, yet we would fain hope that the time is not far distant when we shall see a most decided improvement both in the style and use of this important implement of husbandry:

The horse-hoe, as its name indicates, is of course intended to supersede the hand-hoe and its uses may be defined as follows:

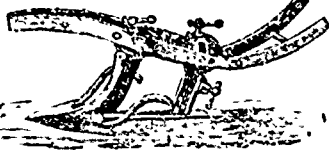


FIG. 4.

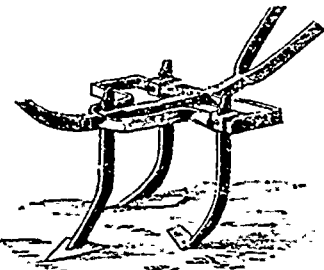


FIG. 6.

2nd. To thoroughly stir up and loosen the soil about the roots of plants or grains in order to admit the sun's rays and the oxygen of the atmosphere.

A very good and cheap implement of the kind, which answers the purposes of both a weeder and a scuffler is now very much in use amongst our farmers. It is adapted admirably for turnip, potato and cornfields, and is drawn by one horse. (See Fig. 1)

It consists of a central longitudinal wooden beam, into the top of which a pair of plough handles are fixed for guidance; and to each side of it a side beam or wing is hinged, the whole having somewhat of the A harrow appearance. It is provided with three different ploughs, one fastened to the central beam near the front, and one to each wing, and these ploughs are reversible, so that by one trip the weeds are uprooted and thrown into the centre between the rows, and by a second, with reversed side ploughs, the soil is placed up to the roots of

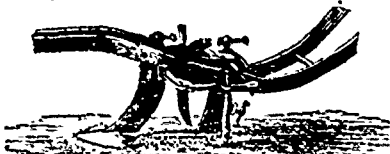


FIG. 3.

plants, equally as well as this could be done with a regular plough. The depth of dig is also regulated by a wheel in front of the implement, and the side wings

may be expanded to any required width for the ridges.

Another, and still more serviceable implement than that just described, is the "Iron Universal Plough" which by slight alterations may be used in three different ways, viz:

1st. As a Double-Tom or Ridge Plough, used for opening and closing the land in ridge-work, at any distance where the manure is deposited, also for setting out lands for common ploughing, opening surface drains, or as a moulding plough for moulding up root crops, peas or beans. (Fig. 2.)

2nd. As a Horse-Hoe or cleaning plough, the mould-board and heel-piece, or back part of the frame,

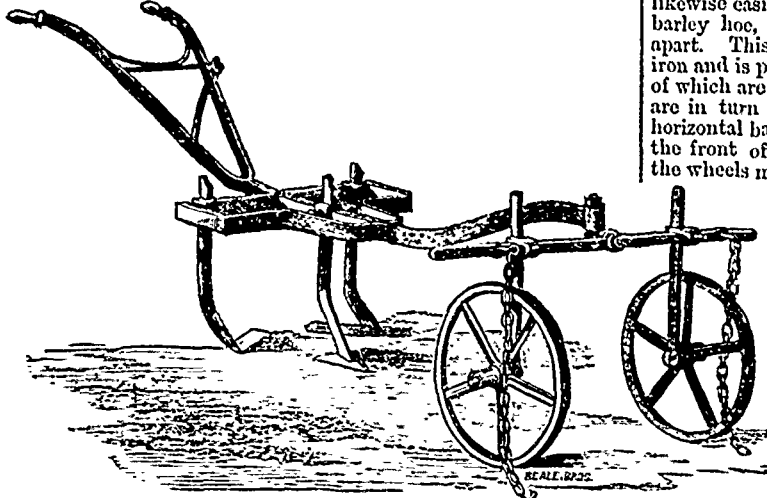


FIG. 5.

being removed, and two frames which shift to any width, with a share in front, and two curved cutters being attached, it forms a perfect horse-hoe, the share cleaning the bottom of the furrow, while the hoes shave the sides of the ridges. If required also to be used as a Scarifier for bean rows, potatoes,

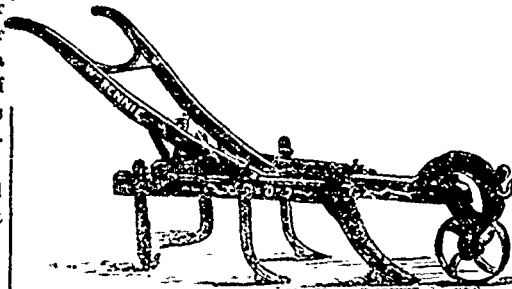


FIG. 1.

etc., flat hoes can be substituted for curved cutters. As the hoe-frame will expand about 3 ft. 6 in., it will allow two flat hoes to be used on each side. (Fig. 3.)

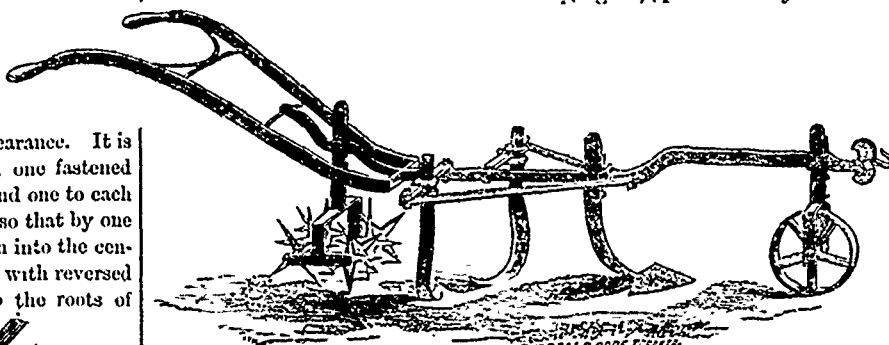


FIG. 8.

3rd. As a Skeleton or Broad Share Plough, a 14 in. or 18 in. share being used and small mould-boards, or, if preferred without the mould-boards, prongs may be used. In the former case it will effect good trench ploughing, in the latter it will break up the soil and leave it in the best state for pulverization. Or if it be desired merely to cut up weeds, the large broad share only may be used without prongs. As a skele-

ton plough a large single-winged share is to be used either with or without prongs. The entire weight of this implement in any of its forms, averages about 2 cwt. The above is of English origin and designed for one or two horses. (Fig. 4.)

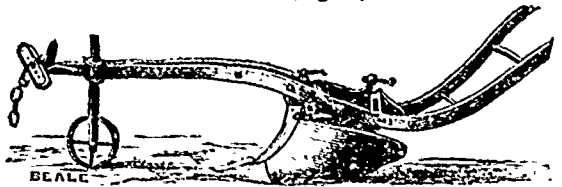


FIG. 2.

Another excellent article of its class, also of English manufacture originally, is the "Universal Steerage Horse-hoe" (Fig. 5), which is adapted for hoeing one row of beans, potatoes, turnips, &c., and likewise easily convertible into a four-row wheat or barley hoe, taking the rows at about nine inches apart. This implement is made entirely of wrought iron and is provided with two front wheels, the axles of which are fastened to two vertical iron rods, which are in turn fastened above, so as to slide along a horizontal bar which is fixed on a swivel just below the front of the beam. By means of these slides the wheels may be made to approach or separate from one another to suit the width of ridge. The wheels are likewise sufficiently high to carry the frame over young plants without injury.

A universal joint is fitted in the centre of the front bar, upon which the implement swings, so that when hoeing on uneven ground the same depth is ensured in the hollow as on the flat or hill-side.

The centre hoe also slides along the centre beam, and may either precede or follow the side hoes; also, when used on adhesive soil, the hoes can be placed farther apart to prevent

clogging; and, if the soil is very hard, two grubbers can be fixed to the front bars of the frame to break up the crust and assist the hoes in working. (Figs. 6 & 7.)

In the various implements thus far described we have made use of the words "prongs" or "ploughs" as applicable to those parts of the horse-hoe which enter the ground and uproot the weeds. We might, instead, have called them "tynes," as some designate those which, instead of curving forward, turn inward, and cut along the ground horizontally at any required depth.

In the cases given, moreover, all the principles thus far put into practice are fully brought out, as regards horse-hoes.

There is just one other idea which we might mention, one which has been deemed a great improvement by some farmers who have seen it tested,

and that is the addition of a revolving toothed hoe, which is sometimes attached immediately behind the tynes. The object of it, as will readily be seen, is to effectually bring the weeds to the surface, and thus facilitate their wilting and withering by exposing them wholly to the rays of the sun. This idea is, we think, a most important one, for it is the sad experience of but too many agriculturists, that

after all their weeding, grubbing and scraping, the ever noxious weeds are only too ready to take root again, unless every fibre is separately killed dead. An illustration of this implement is seen in Fig. 8.

Wood is 7 to 20 times stronger lengthwise than transversely.

Melted snow produces about one-eighth of its bulk of water.

At a depth of 45 feet, the temperature of the earth is uniform throughout the year.

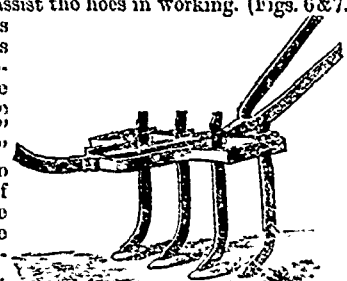


FIG. 7.

Grasses and Storage Plants.

THE CARROT.

So invaluable is this root that no farm, even the smallest, should be without its patch of them. The advantage of a good crop of carrots can hardly be over-estimated.

Carrots may be grown with success on soils that would produce but light crops of either mangolds or turnips; and are less liable than the latter to casualties from insects or disease. The greater expense attendant on hoeing, lifting and storing the carrot crop, however, tends materially to curtail the area of its cultivation. Still its cultivation might advantageously be greatly extended. Horses are much benefited by them. For milk cows they are especially valuable, producing milk of superior quality and in great abundance; and the butter made from such milk is rich in quality and color, and entirely free from any disagreeable flavor as in *turnip* feeding. Indeed, for all descriptions of stock, carrot are most healthful and nutritious.

Varieties.

For field use, the varieties most approved are as follows:—

The *Atringham*, red colored, grows well out of the ground, with a broad head, rounded at the top, and tapering somewhat abruptly towards the end. It manifests rather a tendency to "sport" even when the roots intended for seed are selected with the greatest care; this has not unfrequently a considerable influence on the productiveness of the crop.

Large Red, or *Orange Cattle Carrot* is coarser than the preceding variety, grows deeply into the ground, thickish at the upper part of the root, with a gradual taper to the end; color, lightish red, with rather a large centre or heart.

Long Red, or *Long Surrey*, is of a deep red color and very small centre, grows well into the soil, is a thinner carrot than the former, but of finer quality.

Short Red, or *Horn*, is a larger and coarser description of the garden, Early Horn or Dutch carrot, and well suited for soils that are too shallow for the deeper rooted varieties. It has a thick, short, conically shaped root, broad at the top, with hollow crown, and carrying but little stem; grows well out of the ground, and is of undoubted quality.

The *Large White Belgian* is unquestionably the one best suited for general field culture, especially in the genial loamy soils of Canada, as any observant visitor to our various agricultural exhibitions could not fail to have noticed. This variety grows well out of the ground, and possesses a root thicker in proportion to its length than the other field varieties, and owing to these characteristics it can be more profitably cultivated than those which require a greater depth of soil for their growth. The lower part of the root is white, the upper part green, with a well rounded top.

The *Yellow Belgian* is also a very prolific variety, of finer quality than the *White*. Its root is also longer, of a deepish yellow tinge, with a green top, less thick than the white, and better suited for the lighter than the stronger class of carrot soils.

Suitable Soils.

The soils best adapted for the growth of the carrot are deep sandy loams; light sands, and gravels come next, whilst the stronger clayey soils are only third in order of suitability. Indeed, there is scarcely a description of soil that cannot be made to yield a more or less profitable crop of carrots. The great art in the growth of a good crop is the thoroughly pulverized condition of the soil, and freedom from weeds and stagnant water. It is also essential that there should be depth of soil, and where this does not naturally exist, recourse must be had to artificial means to produce it by deep ploughing and subsoiling, or the subsoil loosened in some other way to a

sufficient depth. In the absence of this necessary condition the carrot becomes stunted if the sub-soil is compact and hard, or if sufficiently porous to admit of the penetration of the root, the chances, are a considerable portion of it will be broken off in the lifting at harvesting, and left in the ground. This stirring process is also essential to enable the plant to develop its tendency of sending, at an early stage of its growth, its long, thin tap-root deeply into the soil in search of food for the requirements of its upper portions. And it should be the constant aim of our mode of cultivation to encourage the plant in this habit of reliance upon the tap-root rather than to derive its nourishment by throwing out forks or lateral subordinate roots nearer the surface. This tendency to "fork" is particularly observable in unfavorable soils, whether owing to mere shallowness, the presence of large stones or other obstructions, or to badly tilled soils abounding in buried clods or hardened lumps of earth, or to the application of farm-yard manure in its green or frosted state, applied at the time of sowing the carrot seed. In the latter case the root is naturally apt to follow in the direction where its supply of food is most readily obtainable, instead of pursuing its normal habit of searching for it in the subsoil, a property, indeed, in the carrot that, both from a chemical and physical point of view render it of such value as a rotation crop. This habit of extracting its supplies of food so largely from the rich mineral stores of the sub-soil fully accounts for the fact frequently commented on by farmers, that a crop of wheat is often more productive after a crop of carrots than of turnips, the one plant being a *sub-soil*, and the other a *surface feeder*. In the preparation of the soil, it cannot be too urgently insisted on that there should, if possible, be an entire absence of weeds of all kinds; indeed, in the case of the carrot crop, this matter is *all important*, as, from the slow process of germination in carrot seeds, if there are any seeds in the carrot-break, they will speedily take possession of the soil and considerably check the growth of the young carrots if not finally overpower them altogether. Where the subsoil plough is available, it should immediately follow the ordinary plough, taking an equal depth, and thus stirring the soil to the depth of one or eighteen inches. By harnessing the horses of the leading plough "tandem fashion" instead of abreast, they both draw on the land, and instead of one traveling in the furrow, which would, in this case, do an injury by treading down the soil moved by the "subsoiler," which, with two good horses attached with a depth two-thirds that of the furrow of the surface plough, follow close behind it, and get over the same amount of ground in the day.

Manures.

The manure applied should always be in a thoroughly well-rotted condition so that it may readily be incorporated with the soil and for the better accomplishment of this purpose should be ploughed in the fall. By so doing the inducements to "fork" are very considerably diminished, a very important matter in the successful growth of this crop. If artificial manures are used, it will be found very beneficial to either broadcast them immediately previous to, or drill them in at the time of sowing the carrot seed. No better fertilizer than Peruvian guano for the purpose can be applied. Soot and salt is also a favorite manure for this crop, in the proportion of eight or ten bushels of soot and from twenty to thirty bushels of soot per acre. Charcoal is said to hasten germination by attracting moisture.

Preparation and Sowing of Seed.

The seed of the carrot differs from all our other farm seeds in being covered with stout short hairs, which are attached to the outer surface or skin of the seed and prevent it to a great extent from coming in direct contact with the substances of the soil in which it may be placed. In course of time the hairy attachments absorb moisture and convey it to the inner part of the seed, which then sets up a germinative process and the growth begins; but as this necessarily depends upon the conditions under which each seed is placed in the soil the germination is very irregular, and in some cases, does not take place at all. There is also great difficulty in separating the seeds, which being very depressed, nearly flat indeed in shape, are held together by their hairy envelopes, and thus an equal distribution in the drill is well nigh impossible. To overcome these two obstacles it is usual to mix the seed required, that is

from 2lbs. to 4lbs. per acre, with moistened sand in the proportion of two bushels to each acre to be sown. This should be done with proper care, so that the quantity of seed per acre should be equally distributed through the mass, which can readily be secured by adding the sand in small quantities at first to the seed, and mixing them together intimately with the hand taking care that no lumps of seed remain adhering together. When the mass is thoroughly mixed up, it should remain so for a week or ten days, being occasionally turned over with a shovel, and watered if necessary to keep it in a proper condition of moisture. By this process of preparation each seed is separated from the others, and brought into contact with a moist surface, the germinative process is set up previous to its being deposited in the soil where it continues its functions, increases its growth, and speedily shows itself above the surface. It is of great importance that the seed be *quite fresh*, the produce of the preceding year's plants, as if great care and precaution is not used in the selection, an unsatisfactory return is likely to be the result, either from the plants throwing up seed-stems, instead of forming roots, or from the roots formed being forked and fibrous, instead of plump and straight.

The drill is decidedly preferable to broadcast sowing for sowing, whether as regards economy of seed, or labor in the after process of hoeing. It is a good plan to drill in a few quarts per acre of any tailings of oats or barley, or even a little turnip seed, as the more rapid & vigorous growth of these more easily point out the course of the drill in depositing the more tardy growing carrot seed; this, however, is only necessary where weeds are abundant. The horse-hoe should be kept steadily at work, when practicable, between the rows, which, in the case of carrots, need not be further apart than 18 inches. And when, in about three weeks from the time of sowing, the young plants have acquired a growth of about 3 inches high, they should be thinned out with a narrow-bladed hoe, taking a four to six inch cut, and leaving spaces untouched about half that width all along the drills. The plants should then be singled out by careful hands, leaving the healthiest and most vigorous plants, so that they may stand at about six to nine inches apart in the drill.

Harvesting and Storing.

It is very desirable to select a dry time for lifting, and previous to frosty weather, for though the carrot will withstand a severe frost in the soil, yet the roots are readily injured by frost when removed from it. Besides in frosty weather it would be impossible almost to fork the carrots out of the ground, and in wet weather the roots would be in bad condition. Carrots are usually forked up; a fork with an ordinary handle, and with two prongs only, about 12 to 14 inches long, and set about 3 inches apart, with a "shoulder" on each side sufficiently wide for the foot has been found to do the work very efficiently, even on strong soils. A small spoon-shaped instrument is also used for the same purpose and answers better on some soils than the fork. Of course the roots should be injured as little as possible, and are best laid regularly in long rows ready for those following to cut off the tops, and the rows should be wide enough to admit of the passage of a cart or waggon without doing injury to the roots of the carrots. It is desirable, however, before carting them off the field to give them a few days' exposure, for the purpose of evaporating as much of their natural moisture as possible, and this is best done by placing them in small heaps on the ground and covering them over with a layer of tops, so as to protect them from the dews and morning frosts prevalent at that season of the year. The simple process of cutting off the leaves requires more consideration than at first might be imagined; some cultivators say that a small portion of the crown of the carrot should be cut off with the top, as this prevents any after vegetation; others affirm that cutting into the carrot causes it to rot. The practice of removing the leaves close to the crown appears to be the best, for though the shoots may deprive the root of a part of its goodness, yet these can always be removed before they do any material injury, if the heap is occasionally looked over.

Large crops of Belgian carrots can be, and are, raised in Canada, varying from 600 to 1,200 bushels, or even more, per acre, according to suitability of soil, manual and climatic conditions, and we would conclude as we began, by strongly urging every Canadian farmer to cultivate a portion of his fallow-break with so valuable and productive a root crop as that of the carrot.

ORCHARD AND HERDS GRASS.—Orchard grass is very light and chaffy, and when sown alone not less than two bushels is required. Of Herds grass, one bushel per acre. If mixed, half these quantities—and so when sown with clover or timothy.

Veterinary Department.

DISEASES OF THE HORSE'S FOOT.

Thrush.

Thrush is a very common disease and often seen in the hind feet. It consists in a discharge of a purulent matter, with a very offensive odour from the cleft of the frog. The discharge is the result of a diseased condition of the sub-cuticular covering of the frog, and particularly the cleft.

The great exciting causes are wet and filthy stables, or farm-yards, or any acrid moisture whatever. In the fore feet it is occasionally a sequence of sub-acute laminitis, and navicular disease.

In the treatment of this disease it is of the utmost importance that the feet be kept scrupulously clean, and the cause removed by placing the horse in a comfortable box or stall, all semi-detached pieces of horn should be carefully pared off, and the parts afterwards dressed with a solution of carbolic acid or chloride of zinc lotion. The dressings should be carefully applied to the bottom of the cleft. When it is necessary to work the horse, introduce into the cleft of the frog a pledget of tow saturated with Barbadoes tar, which should be renewed every second or third day.

Punctured wounds of the foot, as pricks, gathered nails, etc., are very common, and often attended with very serious results, which vary according to the parts injured. A foreign body may penetrate a considerable distance in the region of the frog without doing any great harm, but when coming in close contact with the coffin joint, acute inflammation is set up in that part, which is exceedingly difficult to subdue. In other cases, the body penetrates so deeply as to wound the bone, which is often followed by gangrene of the foot and limb, causing constitutional fever and death in a few days.

The symptoms of these injuries are in most cases well marked and severe. There is sudden lameness, which gradually increases. If the fore foot is the seat of the injury, the animal when standing points the foot and flexes the limb. In a short time there is great heat around the coronet; and in all cases the lameness is greatly increased when the horse is made to turn round—the weight being then thrown upon the injured foot. When the hind foot is affected, he takes a very long step with the injured foot, bringing the toe carefully and cautiously to the ground, a symptom at once shewing that the cause of lameness is situated low down. Whenever the foot is suspected as the seat of disease or injury, a further and more careful examination should be made by cleansing out the foot, when the offending body may be detected. In many cases, however, owing to the substance penetrating deeply, and becoming buried in the sole or frog, it is necessary to remove the shoe, and carefully cleanse the sole and frog with the drawing-knife, because in such cases without making a careful examination the nature of the injury may be overlooked, and irreparable injury the result.

The position in which an animal suffering from a severe puncture of the foot keeps the limb, is very apt to mislead the inexperienced as to the true seat of the disease. We have often met with cases where blisters had been applied to the hock and stifle when the poor animal was suffering from an injured foot. If the irritant remains for any length of time in the foot, extensive inflammation is produced, which speedily results in suppuration, and whenever matter forms within the foot, the pain is increased tenfold, and if it is not allowed to escape through an opening in the sole, it gradually extends upwards, a swelling appears on the coronet, which is hard and hot, and painful, soon however becoming softer, and speedily bursts discharging matter freely. Very extensive disease may arise from the foot being punctured without the body becoming lodged in the sole, when a very careful examination is required to detect the injury.

Punctured wounds of the foot although apparently trivial require careful and judicious treatment. In the first place, the source of irritation must be removed. In recent cases it may not be necessary to pare out the foot, but it is generally advisable,

immediately after removing the irritant, to cleanse the parts thoroughly and apply a pledget of tow saturated with tincture of benzine or carbolic lotion, with the view of preventing dirt or moisture getting into the wound. If the pain and lameness disappears in the course of one or two days there is little danger to be apprehended, but if the pain continues or increases, the shoe should be removed, and the foot enveloped in a poultice of bran, turnips, or linseed meal, and when matter is suspected to have formed, the sole must be carefully cut down, and the matter allowed a free means of escape. The foot should then be immersed for an hour in a pailful of warm water, and afterwards poulticed. In some instances proud-flesh appears, which must be reduced by a mild caustic. In all cases where the irritation and fever is great, the horse should be given a moderate dose of purgative medicine, and the general comfort of the patient be well attended to, by placing him in a well littered box or stall. In severe and tedious cases, if the horse does not lie down, it may be necessary to use slings, which is especially the case when the hind foot is affected, as the whole weight of the animal being unduly thrown upon the sound foot extensive disease may ensue, and it not unfrequently happens that ringbone and laminitis results from that cause. Whenever the acute symptoms are relieved, a shoe may be applied and the sole protected by a leather sole, with a padding of tow and tar.

Ticks on Sheep.

I find that many small flock-owners are complaining of the presence of ticks on their sheep. It is usually the case that ticks are more prevalent in small flocks than in large ones, owing to the fact that owners of large flocks take pains to dip the lambs in a decoction of tobacco, two or three weeks after the flocks are shorn. But when only fifteen to twenty-five lambs are raised, the trouble of dipping the lambs seems out of proportion to the size of the flock, and as a consequence, the ticks have a free run. Ticks can be killed in cold weather, but it takes some time and patience to do it without injuring the health of the sheep. At the same time it is necessary for the health of the sheep that the ticks should be killed before the wool begins to start in spots, or the animals become so reduced in flesh that they become liable to succumb to the change from hay to grass in the spring. There is no excuse, really, for the great loss of wool and of sheep from the presence of these voracious parasites.

One common remedy for use in cold weather is good snuff. If the wool is opened in spots along the back, shoulders, belly and sack, and a very small pinch of snuff is put in with the thumb and finger, in contact with the skin, most of the ticks will get killed in a few days. Particular attention should be paid to the neck and shoulders in using this remedy. The principal objection to snuff is, that the wool remains more or less discolored until shearing time. Besides this a few ticks usually escape—enough to infect the flock for another year.

Another remedy is mercurial ointment (*unguentum hydrargyri*) mixed with hog's lard—one part of the ointment by weight, to eight parts of lard. This mixture is to be applied in the same way as directed for snuff, using in each spot only just as little as will adhere to the tip of the forefinger. After using mercurial ointment, the sheep must be rigidly protected from cold winds and from getting wet for at least four weeks. Half an ounce of the mixture will usually be sufficient to go over an ordinary-sized lamb, and if the ointment was of full strength, every tick will soon disappear. The remedy is usually thorough, but dangerous, unless special care is taken of the flock.

There is another remedy which I once saw used by a neighbor, an Englishman. He made a strong decoction of tobacco, and put arsenic into the liquor at the rate of a pound to one hundred sheep; this was poured along the back and sides of the sheep, the wool being opened by an attendant, an old coffee pot being used for convenience and economy in pouring. The remedy was used primarily to cure the scab, which disease was not only permanently cured in the flock, but every tick was killed at the same time.

Either of the above remedies can be used in cold weather, due care being taken to protect the flock from cold or wet storms; and they will save ten times their cost in improvement of condition of flocks, or in fodder saved. If any reader of the *Journal* has his sheep infected with ticks, the time to kill them is now.—*Eric, in Live Stock Journal.*

Entomological Department.

Insects at Fairs.

If there is any one branch of natural science of which the cultivators of the soil are more destitute of knowledge on than another, it is that of Entomology. We doubt if one man in a hundred knows that the white grub which works such sad devastation to meadows and gardens, and the common large May Beetle which flies into our rooms during the early part of the summer, is one and the same insect, only in different stages of existence; and the same rule will hold good all through the catalogue of our injurious and beneficial insects. We have had books written in goodly number which give valuable and interesting information in regard to the habits of our common insects, but they are necessarily expensive, and very few persons will buy and read them, even if they are able to, and have leisure for study. We must devise some other method of attracting the attention to the subject of insect life. We do not know a better plan than to offer prizes for insects to be shown at every town, county and state fair. If young persons could once see even a small collection of insects correctly named, it would attract their attention, and we should soon have hundreds and thousands of observers in this great and almost unexplored field of science. A few men, here and there, are doing an immense amount of work in this field, but their labors are not appreciated, owing to the ignorance of the masses. Three States of the forty do pretend to pay an Entomologist a small sum to make a meagre annual report or talk to those who will listen to what they have to say on this all-important subject. We say "all-important," because millions of dollars' worth of grains, fruits and vegetables are annually destroyed by insects, and a greater part might be saved if the masses knew anything of the life about them, as seen in the insect world.

Agricultural and horticultural societies are now, or soon will be, making up their lists of premiums for the coming season of fairs, and we hope their officers who have this department in charge will see that liberal premiums are offered for collections of insects. Let this thing once be fairly begun and we will soon see splendid exhibitions of entomological specimens, and our ladies and gentlemen will not be calling every little fly, beetle, grasshopper or spider a "bug"—*Rural New Yorker.*

The Radish Bug.

This insect *Nysius raphanus*, has not hitherto been described; the reason, we suppose, is that it has not hitherto attracted the notice of farmers and gardeners as a destructive insect. We have noticed it this season, for the first, attacking radishes, mustards and lettuce; some have noticed it on cabbage, others on grapevines, and in Kansas it is doing great damage to the potato crop, and we are informed that a very similar, if not the same species, attacks corn to an alarming extent; but, as we have not as yet seen the species from corn, we cannot say that they are identical, but suppose that they are. It seems to be almost a general feeder, as it is not confined to any particular order of plants for its food, though in this locality it seems to confine its ravages mostly to *Citricerae*. They will congregate on the plant as long as there is room for one of them and continue sucking the life-supporting juices, which soon causes the plant to wilt and die. They are very active, and, when disturbed, swarm like so many gnats, which they more resemble, when flying, than any thing else. In the morning, while the dew is on the plants, they are found concealed in the shrivelled up leaves, and are rather sluggish; and by plucking them and putting them into an old tin pail, with live coals of fire at the bottom, many of them may be destroyed. Lime has been tried to a slight extent, but seemingly without effect. We have not discovered either the eggs or the young, yet, like their cousin the chinch bug, wet weather is unfavorable to their production, and after a heavy rain it will be difficult to find many of them for several days. We give herewith the first description of this insect, to our knowledge, that has been written. The specific name, *raphanus*, was given it from its food plant, the radish, upon which we first noticed it. It belongs to the sub-order *Heteroptera*; and, like most insects of that order, is not by any means destitute of that unpleasant "bed buggy" smell. We hope by the end of the season to be able to procure the eggs and young, and to be able to write a more complete history.—*Wm. R. Howard, Forsyth, Mo., in Canadian Entomologist.*

Horticulture.

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

THE FLOWER GARDEN.

The Iris Iberica.

This variety of the Iris is so striking and curious, and withal so beautiful, that we have endeavored to give our readers some idea of its appearance by presenting them with the accompanying engraving.

The outer segments, it will be seen, are reflexed. The surface of these is a rich brown, beautifully netted and veined with darker markings, and a blue-black spot in the centre of each segment. The inner segments are erect, of a light color, in which blue and pink are most delicately blended and shaded, and handsomely pencilled with darker veins.

The flowers are large and showy, the leaves long and sword-shaped, and not so broad or flat as the common Iris of our gardens. The plant promises to be hardy, being found in the Caucasian mountains at an elevation of six to seven thousand feet, and has been successfully wintered in the open ground by Mr. T. S. Ware, Tottenham, England, during the past three winters without any protection whatever. It seems to prefer a light sandy soil.

There are several varieties of this Iris, differing somewhat in the coloring and marking of the flowers, but all beautifully striking and curious, and should they succeed as well in Ontario as in England, will prove most decided acquisition to our hardy herbaceous flowering plants.

Culture of the Verbena.

To grow Verbenas well it requires a good bed in the right place. But it should be where there is plenty of sunshine, as they will not succeed in the shade. Any good, sufficiently deep, rich and friable soil will grow them. A lawn too is a fine place for them. Cut out a round bed, or any other shape desirable, on a lawn or grass-plot; invert the sods and place them in the bottom of the bed; put six or eight inches of good soil on the surface; set a good plant of double zinnia, or a geranium in the centre. Buy or beg a dozen or more of good, strong growing plants, not high-spiindling affairs (particularly if you have to buy them; set them two feet apart in the bed. If they are pot plants, set them so that the bottom of the verbenas be six inches deep. If the plant is branching as it should be, bend off the branches in a slanting position, and fill in the centre with soil nearly to the surface, water freely to settle the soil around the roots; and then fill up the space with dry soil to prevent baking. Peg down the plants as they spread, and keep the soil well cultivated and of course free from weeds. You will then have a fine bed of verbenas. If you should want to grow good seedlings, get good plants to begin with. The best

verbenas produce the best seed, especially the scented and red colors, just as the best peaches do, but you cannot entirely rely on either. The probability is you will be satisfied with the finest that have been raised, without troubling yourself about your own seedlings. This is more the province of the professional florist. When you are tired of your verbenas or they should perish, or grow too rusty and black, you can spare them in, and this process will enrich the soil sufficiently, especially if done yearly. The plants that have blue, purple and white colors have the most seed, and the flowers of most of them are sweet scented. A few years past a fragrant verbenas

vigorous shoot, yet is a little hardened at the base. It is also essential to have a bud or joint at or near the end of the cutting as roots strike from it, and the nearer it is to the base, the greater your chance of success.

Plant your cuttings in common red pots, filled half-full of rich loam, and two inches of sand on the top (scouring sand will do, but not sea sand), wet this thoroughly, and put the cuttings close around the edge of the pot, for if the bud-joint comes in contact with the surface of the pot, it seems to strike root more quickly. Pull off the lower leaves before you plant the cutting. Press the wet sand tightly

about the tiny stem, for a great deal of your success in raising the cuttings depends upon the close contact of the sand with the stem. When the cuttings are firmly planted, cover them with a glass shade if possible, for it will greatly promote the growth of the plants. Moisture, light and heat are the three essentials to plant life; without them no cutting will start. Shade for two or three days from sunlight, but don't let the sand become dry; then give all the sun you can obtain; keep up a good supply of moisture, and you can hardly fail to root most of your cuttings.

Cuttings of roses, verbenas, oleanders, heliotropes, etc., etc., can also be rooted in small vials filled with warmish water, and suspended from the window casement. Select the cuttings as above described; pull off the lower leaves, and insert the end for about an inch into the vial. Tie a string about its neck, and hang in the sun. If a bit of cotton wool is wrapped about the cutting where it goes into the neck of the vial, and it is kept wet, it prevents the rapid evaporation of the water. When the tiny roots show themselves, about an inch or more in length, fill up the vial with a rich composted soil; let it hang for two or three days longer, then break off the glass carefully, without disturbing the roots, and pot the plant. Managed in this way the roots receive no check, and the plant will grow very vigorously. The cutting can be taken from the water and the roots planted in pots, but they will cling closely together, and are not as naturally disposed as when the glass is broken off, after the roots are covered with soil. If the water evaporates a third or more in the vial, it must be filled up with warmish water.—*Floral Cabinet.*

New White Hybrid Perpetual Rose.

Mr. Bennett, of Stapleford, writing to the *Floral World* says, "I wish to draw particular attention to Mons. Lacharme's white rose, *Madame Lacharme*, which I saw at the Universal Exhibition, in Lyons, July 6th, 1872, when it was deservedly awarded a first prize. I also saw a large number of plants in full bloom in equally good form at Mons. Lacharme's; it appears to be even a stronger grower than its parent, has very large, handsome Jules Margottin foliage and wood; the blooms when fully expanded are about four inches and a half in diameter. It is certain to be of good constitution, as it withstood the severe frost of last winter triumphantly."



was a novelty. We have now quite a variety of them. Gather your seeds early in the morning when the dew is on, or after a shower. Do not use heating manure, as it will make the plants rusty-black. The bright and showy flowers of the verbenas, make it the most popular bedding plant in cultivation.—*Rural Express.*

THE WINDOW GARDEN.

To Manage Cuttings.

In selecting a cutting a great deal depends upon a judicious choice, if the slip is too young and full of fresh sap, it will fade away from too much evaporation, and if it is too old—i. e., hard and woody, it will take a great while to strike root. You must take a cutting that is partly ripened, and is from a

THE FRUIT GARDEN.

Raspberries.

Hitherto the Raspberry has not been as generally grown in our gardens as the strawberry, and the supply of the market has been chiefly obtained from those found growing wild, which are much inferior in size, beauty, and flavor to most of the varieties now cultivated. One of the causes of the past neglect of this delicious fruit is to be found in the fact that the Antwerp raspberries, introduced from England, will not endure the climate of many parts of Ontario, the severe winters killing the canes if left unprotected. In the Province of Quebec, where the snows fall early and deep, and remain all winter, the tenderest varieties of raspberry are sufficiently protected by the snow, and no difficulty is experienced in raising fine crops.

Of late years attention has been turned towards the production of more hardy varieties, and some have been found which endure well the changeable winters of southern and western Ontario, so that a fair crop of fruit can be counted on every season. Our Canadian hybridists have been trying their skill also upon this fruit, and Charles Arnold, of Paris, and Wm Saunders, of London, have attained results which promise to be of value to the consumers of raspberries.

The strawberries are hardly gone before the early varieties of raspberries begin to ripen, so that those who have a few stools in their fruit garden will be able to keep the table supplied with choice fresh fruits without intermission. And though perhaps one may say that we never tire of eating strawberries, yet when they are nearly gone, and the first fully ripened raspberries are placed upon the table, they are relished with a zest which makes one doubt for the moment if he does not almost prefer the raspberry. If, too, our good people would banish pies and cakes from the table and supply their place, at least during all the summer and autumn, with fresh berries in season, then pears, and apples, and grapes, they would find the change most beneficial to health, and the fruit no more expensive than pies and cakes, and much more pleasant to the taste.

Planting the Canes.

The raspberry thrives best in a very deep, well drained, rich moist soil, that retains its moisture well through the heats of summer. If the preparation of the soil has been thoroughly attended to, as laid down in our suggestions under the head of Kitchen Garden, it will be in good condition for planting. This may be done in the fall or spring. If planted in the fall in those parts of the country where they are not likely to be covered all winter with snow, some coarse litter, such as corn-stalks, straw manure, &c., should be thrown over them to keep the frost from heaving them out. The plants for garden culture may be set in rows six feet apart, and the plants three feet apart in the row. In field culture, for marketing, it is better to plant six feet apart each way, so that the ground can be cultivated in all directions with a horse. In planting, care must be taken not to break off the buds which are sprouting from near the roots, it is from these buds that the canes are to be formed, which will yield fruit next year. The plants should be set in the ground deep enough to cover these buds well, say to a depth of about two inches.

Cultivation.

As soon as these buds have grown sufficiently to make their appearance above ground, the ground should be thoroughly stirred and cleaned of all weeds; and so through the entire summer, frequent stirring of the soil will much promote the healthy and vigorous growth of the raspberry canes. During this, the first season after planting, be sure to prune back each cane about the end of July to within one foot of the ground, and if there be side branches on the portion left, cut them back to within four or five inches of the main cane. *This pruning back during the first summer is very important in order to secure a strong vigorous plant for years to come.*

The next season some fruit will be gathered from these canes, and new, strong shoots will come up from the ground to form canes for fruiting the following summer. The canes that bore fruit will die in the autumn, and as they are of no further use, but in the way of the young canes from which the fruit will be gathered next year, they should be cut off at the

ground as soon as the fruit is all gathered and taken away. The young canes of the second summer should be allowed to grow about two feet high and then the top pinched off, and the lateral branches be kept pinched back to about eighteen inches in length. The third and subsequent seasons the young canes should be pinched back when from twenty-four to thirty inches in length, and the side branches stopped at about eighteen or twenty inches from the main cane. If the plants are thus pruned during the growing season they will become strong and stocky, requiring no support and yielding fine, large fruit, which will be bore up out of the dirt.

Every year, as soon as the fruit has been gathered, the canes that bore the fruit should be removed, that more room and air may be given to the young canes that are growing up to supply their place, and in the autumn a liberal supply of well rotted manure should be spread on the surface of the ground, particularly over the roots around the stools. And if the ground be kept well mulched near the plants, where it is not likely to be stirred when cultivating, the labor will be well repaid by the superior quality of the fruit.

We shall hereafter describe a few of the more valuable sorts that may be advantageously grown in this climate.

Early Melons.

If you want early melons plough up a piece of soil as deeply and as early as possible. Now, when the soil is in the right condition to stir, be sure to get it mellow. Plant the second week in April, if you wish, ten feet one way by five feet the other. In planting, take a flower pot or a common crock that has no bottom; place it over the hill, then bank up the earth all around the outsides of it to the height of 4 inches, pressing it solid. Then take hold of the crock and give it a twist or two, so as to loose it from the earth; carefully draw it up so as to leave ridges of the earth standing. Plant the seed inside, and cover three-fourths of an inch with good rich earth. Now take a common window glass, say 8 by 10, and place over it, leaving it till the plant comes up. Then take a lump of earth, or a stone, or anything suitable, and lay it under one side or end of the glass so as to raise it enough to let in the air. By this method you will harden the plant sufficient by the time frost disappears to remove the glass. Two plants to the hill are sufficient.—*Cor. Cin. Gazette.*

Liquid Manure for Strawberries.

An English gardener has been very successful with his strawberry crop for several years on the same bed, and attributes the abundance and size of his fruit to the use of a liquid manure, composed of one pound each of Epsom salts, Glauber's salt, pearl ash and carbonate of soda, and one-half pound of muriate of ammonia to sixty gallons of water. He applies this manure as soon as the plants show signs of growth in spring, watering them pretty freely without a rose, three times, at intervals of about a week, so as to finish before they come into flower; and if the season be dry, he finds it absolutely necessary to supply them liberally with common water afterwards during their whole time of growth, or their increased activity, he thinks, would very quickly kill them.—*Rural Carolinian.*

THE ORCHARD.

The Sum and Substance of Successful Fruit Culture.

The most important items in fruit culture are:

1. Thorough and perfect drainage, either natural or artificial.
2. Proper preparation of the soil for planting; clean after cultivation, and constant care of orchards.
3. Regular manuring of the trees for the first three or four years, unless the natural fertility of the soil is sufficient.
4. Mulching shallow soils under the trees, with shallow culture for such soils to protect the roots from drought in the one case, and their destruction by the plough and spade in the other; as, in such soils, the roots lie near the surface and also require more space to travel in search of food.
5. Deeper ploughing and stirring where the soil is rich and deep, with no mulching beneath the trees.
6. Train according to the habit of the tree, without material disturbance of large limbs.
7. The advantages derived from scraping apple trees are very great.—This operation should not be neglected in winter or spring; the improved appearance and condition of the trees will reward the labor; and it is probable that many insects will be destroyed—at least their harboring places will. A drawing knife is a good implement for this work—use

the back of the knife. After scraping use a strong wash of soap-suds. For very young trees use only the soap-suds and not too strong.

8. The best implement to use immediately under the trees is the garden or spading fork. It breaks the soil well and does but little injury to the roots.—*Farmer.*

Apple Tree Borers.

A correspondent of the *Rural New Yorker* says, that he has prevented the attack of apple tree borers by putting a bushel of tan bark around the stem of each tree. The tan bark answers the double purpose of keeping out the borers and a mulch. No weeds grow through it, and the writer states that he has never known a tree to be attacked, with tan bark around it.

Large Pears and How Raised.

Some of our readers have heard of the magnificent pears raised by Mr. Leighton, of Norfolk, Va. The method of culture, given by him in the *Horticulturist*, is another proof of the old saying that "from nothing nothing springs," and that pears cannot grow without food. His trees, which are dwarf, are planted 12 ft. apart each way—a little further would be better—in large holes, filled with top-soil mixed with a compost of muck, wood-mould and lime—the two first in about equal parts, and the lime one twelfth. No crops are allowed to grow in the pear orchard before June, and the surface is kept clean. Strawberries Mr. L. finds to be the most exhausting. He remarks, "Persons who have not courage and disposition to spare the land and keep it thoroughly cultivated, should not embark in the business of pear culture." The holes in which the trees are set, and which are filled with earth and compost, are three feet deep—which is not in accordance with the theory that trees do best when the roots are near the surface. Mr. L. sums up as follows:

In short, the following are requisite for successful pear culture in Eastern Virginia:

1. Perfect drainage.
2. Stiffest clay soil.
3. Proper planting of the trees.
4. Clean culture.
5. Healthy trees (which can be had of responsible nurserymen direct, without the intervention of an agent, and imparting the satisfaction of having every tree true to name.)
6. Timely supply of proper food for growth of both wood and fruit.
7. Determination, patience, and sufficient of the sacrificing spirit to remove all fruit until the tree has sufficient wood to sustain it without checking the wood growth.
8. Judicious pruning (better none than too much.)
9. Careful picking, packing and handling of the packages.
10. The right kind of an agent to dispose of them.—*Maryland Farmer.*

Transplanting in the Night.

A gentleman, says the *Western Ruralist*, anxious to ascertain the effect of transplanting at night instead of by day, made an experiment with the following results:—He transplanted ten cherry trees while in bloom, commencing at four o'clock in the afternoon, planting one each hour until one o'clock in the morning. Those transplanted during the daylight shed their blossoms, producing little or no fruit, while those planted in the dark maintained their condition fully. He did the same with ten dwarf trees, after the fruit was one-third grown. Those transplanted during the day shed their fruit; those transplanted during the night perfected their crop, and showed no injury from having been removed. With each of these trees he removed some earth with the roots. The incident is fully vouched for; and if a few more similar experiments produce a like result, it will be a strong argument to horticulturists, etc., to do such work at night.

The Canada Red Apple.

The Central New York Farmer's Club referred this variety, with others, to the fruit committee to report whether they would succeed in central New York. The committee says of this variety, that while the tree is hardy and succeeds well, the fruit is too frequently below the medium size, and is therefore better adapted to the garden of the amateur, than to general cultivation, many other varieties commanding a more ready sale in the market.

This apple is one of good quality, but the tree is a poor grower, and for this reason also, as well as on account of the size of the fruit, it has not been generally grown.

THE NURSERY.

Planting Root Grafts.

The implements necessary for this work are two dibbles for each set of four men, a roller, malleable iron rake, a rope three-eighths of an inch in diameter, and a mallet for driving stakes. The dibbles, made expressly for this purpose, are somewhat in the shape of a trowel, but convex on both sides and longer. The roller is made roughly by sawing a section of eight inches off a log of the diameter of 18 inches or 2 feet. A hole is bored through the centre, in which an axle is placed, after the wheel-barrow style; two straight pieces of lath are used for the shafts, which are kept steady and in place by two cross-pieces of lath, one nailed near the roller, and the other near the handles. Cleets are nailed on the rim at such distances apart as we wish the plants to stand in the nursery rows. In marking the rows, the ground should first be smoothed with the iron rake where it is intended to place the row. The rope is then drawn tightly from one side of the block to the other, and fastened at each end by stakes driven into the ground in such a manner that the rope is brought close to the ground. The roller is then passed over the rope, pressing it into the ground, leaving when taken up a distinct mark. The tracks crossing the line at equi-distances, made by the cleets of the roller, guide the planter in setting the plants. The trowel should be set in strictly perpendicular, then pulled quickly toward the planter; the plant is then thrust in by a quick and dexterous movement, the dibble following close behind to press the soil firmly to the root of the plant. The earth must be very firmly pressed to the root of the plant in setting, and too great care cannot be exercised in this particular. More failures occur from neglect of this precaution, than from any other cause.

It is very important that the last working of the soil should be done immediately in advance of the planters, as fresh and moist earth is necessary to proper setting.

Root grafts should be placed deep enough in the ground so that but one bud appears above the surface. It is better to keep the "heads" of the plants a little above the level, say from one to two inches; which can be done by finishing the filling up with a hoe. The stakes should be ready to mark the varieties at planting time, and the names should be written indelibly and legibly. A very good stake is made of strips of pine, planed on one side and sawed 1 1/2 inches wide and two feet long. The stakes should be coated with white lead, and while yet moist, branded with stencil-cut letters, using simply lamp-black and water. Aside from the stakes, a record should be kept of the number of rows of each variety, taking some one point to reckon from.

The plant should not be long exposed to the air in removing them from the boxes. Just before planting, the roots should be dipped in grout, i. e. a thick puddle, made of clay and water, so that they go into the ground covered with mud. The boxes containing the plants should only be brought out of the cellar as needed, as they do not bear exposure to the air and wind, but soon shrivel. Should the plants at any time show signs of shrinkage in the boxes, give one thorough watering and then allow them to rest. Frequent waterings are very dangerous.

Never plant when the soil is too wet to work mellow; but plant as early in the season as the soil can be put in good condition.

The first working necessary will be about the time the weeds begin to show signs of life, when the hoe must be put in promptly. The first cleaning, on account of the small size of the plants, is best done by scraping away the ground from the trees about the width of the hoe, and just deep enough to kill the grass; afterward following with the cultivator as near as possible to the row without moving the plants. The hoeing process may have to be repeated, but usually once hoeing will be found sufficient, if the cultivator teeth are narrow enough to allow close cultivation. Some hand-weeding will always be found necessary near the trees. A cultivator with the narrowest teeth possible, and these slightly curved forward, is best for the first half of the first summer, after which a plow, with thin, narrow shovels, will be needed in conjunction with the cultivator. Keep the surface of the soil always mellow; going over it especially after every rain. Deep cultivation in the nursery rows is not advisable, as the roots must not be mangled.—Heikes' How to Start a Nursery.

THE VINEYARD.

Grape Growers' Maxims.

The following rules are given by the *Rural American*.

1. Prepare the ground in fall; plant in spring.
2. Give the vine plenty of manure, old and well decomposed; for fresh manure excites growth, but does not mature it.
3. Luxuriant growth does not always insure fruit.
4. Dig deep but plant shallow.
5. Young vines produce beautiful fruit, but old vines produce the richest.
6. Prune in autumn to insure growth, but in the spring to promote fruitfulness.
7. Plant your vines before you put up trellises.
8. Vines, like old soldiers, should have good arms.
9. Prune spurs to one well-developed bud; for the nearer the old wood, the higher flavored the fruit.
10. Those who prune long must soon climb.
11. Vine leaves love the sun, the fruit the shade.
12. Every leaf has a bud at the base, and either a bunch of fruit or a tendril opposite to it.
13. A tendril is an abortive fruit bunch—a bunch of fruit a productive tendril.
14. A bunch of grapes without a healthy leaf opposite is like a ship at sea without a rudder—it can't come to port.
15. Laterals are like politicians; if not checked they are the worst of thieves.
16. Good grapes are like gold—no one has enough.
17. The earliest grape will keep the longest, for that which is fully matured is easily preserved.
18. Grape eaters are long livers.
19. Hybrids are not always high bred.
20. He who buys the new and untried varieties should remember that the seller's maxim is, "Let the buyer look out for himself."

THE WINDOW GARDEN.

Plants for Sunny Windows.

Vines for the window, whether in summer or winter, are now the fashion of all fond of winter gardening. A pleasant idea of what plants to place in the window is gained from the following suggestions of a Boston exchange: "If your window is sunny, there is no limit to the flowers you may have from Christmas until the wild ones come again with two maurandias, one white, the other purple, with a high colored dwarf nasturtium (or tropeolum as it is called), an English ivy, and a vigorous plant of German ivy (or senecio scandens) you can make a screen for your window more beautiful than any Raphael or Da Vinci ever designed, for yours is the perfect original of their defective representation. The vines should be at the end of the box, so as to be trained on the sides and over the top of the window frame. Then close to the glass, for, true to its name, it loves the sun, put a heliotrope or two, a trailing winter blossoming fuchsia, a scarlet geranium, and for the sake of contrast, a white one, whose blossoms have a bright eye in the centre. Do not be afraid of crowding the plants, but sow mignonette and sweet aslyssum seed as well as the tiny ones of linaria cymbalaria or coleseum ivy. If not intending to have but one box, do not forget a plant or two of the neat, handsomely marked pumia, for they will give you a mass of flowers from the first week of blooming until put out in the garden in the spring. Yellow myrtle and the plants commonly called wandering Jew and ivy plant, as well as a variety of *Scaevola* known as beefsteak geranium, may be made to creep over the front of the box, and their graceful spays will reach even to the floor, if you wish.—Ohio Farmer

CRANBERRY CROP.—A cranberry field in Burlington County, containing one hundred acres, has employed three hundred hands, who picked by the bushel, clean as they go, making good wages. Fifty acres picked over, yielded 7,000 bushels, four acres of which produced, what seemed to us enormous, 1,000 bushels. Twenty acres more gave only 3,000 bushels, and the remainder made up the quantity to over 7,000 bushels, yet the owners complain of the shortness of the crop. They hope, however, to improve their prospects by gathering from the remaining fifty acres 10,000 bushels more. They expect to sell all to one dealer at \$4.00 per bushel.—*Practical Farmer*

HILLING OF POTATOES.—A correspondent of the *Rural New Yorker* tried an experiment last season with raising potatoes by hilling, and by leaving the surface flat. The summer was wet, giving the hilling the advantage, if any. The result was about the same quantity for each, but the potatoes from the part not hilled were larger, fewer in number, and finer in quality. He thinks much labor, worse than useless, is expended in hilling potatoes.

Fences, Gates, &c.

A Cheap and Substantial Fence.

Allow me to tell you how to make it. First stretch a line where a fence is to be made; then have prepared posts that are sharpened to a point that are seven feet long and about six inches through. Measure off eight feet of the ground and make a hole with a pointed bar about three feet deep, and cut the post firmly into the hole, and continue on the length of the line or fence to be built. Then plow on each side of the line its length, so as to enable you to shovel easily. Then make a bank from each side of the line three feet high. Have the bank two or three wide on the bottom and one foot on the top. Smooth it off nicely on both sides. Then nail on the post a board six or eight inches wide and sixteen feet long about six inches above the bank. If the posts are too long saw them off even with the bank, then saw each side of the bank in quack grass, and saw it on fully from the bottom to the top, and on the top of the embankment; and the fence is finished. In a short time the quack grass will sprout and grow, and the mud will form a sward that will hold the bank from caving or sliding down, and the older the bank the stronger will it become. For who ever knew of quack grass ever running out of land, or of its roots growing weak or less? This makes a cheap, neat and durable fence, and as the grass grows on the sides, stock will eat it off and prevent its going to seed, for quack grass is always sweet, and cattle and sheep will eat it readily. Nor will it spread, for the ditch will prevent its roots crossing. Also, if it were to go to seed, it can easily be moved before it gets to seed. Such a fence will be firmly located, and nothing will go over or through it. The roots of the grass in a few years will penetrate through the embankment, holding the dirt and post tight, so that frost, floods, or tramping of any kind will not affect it. Such a fence will do better on a permanent line or highway fence, than for an inside fence that is to be taken up.—*New York Tribune*.

Painting Shingled Roofs.

The true way to paint a roof is to apply paint on some kind to both sides of the shingles. It is quite as important that the underside of every shingle be covered with paint as the surface, to prevent the water from being drawn up between the courses by capillary attraction. If good shingles are painted on both sides, and good paint applied to the roof once in ten years, it will continue leak-tight for more than a hundred years. * * * When roofs are not painted, moss is liable to collect at the butts of every course of shingles, which promotes their decay more rapidly than alternate rain and sunshine. When oil paint is used for painting shingles, it is always better to employ some light color rather than black, as the apartments of the attic store, beneath a black roof, are liable to be uncomfortably hot in the summer; and more than this, as black paint absorbs more heat than any other color, neither the paint nor shingles will endure as long; as if the roof had been covered with some light-colored paint. A metallic roof covered with light-colored paint will last much longer than if it had been painted with black paint. The most economical paint for a roof is a generous coat of coal-tar once in a few years; but coal-tar will color the water for five years after a coat is applied to the roof.

Farm Gates.

Some farmers never take time to make a gate or have one made (a farm without a gate is like a house without doors—no way to get in without tearing a hole through). Cheap gates are generally worthless. One great mistake is that two-horse gates are made too heavy for their hinges. Three inches square is heavy enough for the hinge-post. The boards or bars should be sawed ten and a half feet long; four inches wide, one inch thick at one end, and three-quarters at the other; thus the heaviest end of the gate next to the hinges. Lumber sawed as above stated is not as easily warped by the sun as if sawed otherwise. All the field and barn-lot gates should be five feet high. When work horses are taken from a field or lot through a gate and there are young colts that wish to follow, they will invariably try the gate first, and four times out of five, if they cannot get through or over the gate, they will try no place else. It helps the looks of a farm so much to have nice gates. Not only this; farmers that tear down their fences to get into their fields, and lay up the gap when they come out, lose so much valuable time during the summer months, when farmers have no time to lose.—*Farmers' Union*.

Apiary Department.

The Lessons of the past Winter.

Our average winters are sufficiently hard and trying, to make bee-keeping a matter of difficulty, demanding the most careful and judicious management. But such a winter as we have just experienced, is an ordeal which comparatively few apiarists are able to endure. It is a crucial test of the stuff they are made of.

Quite a number of bee-keepers will, after such a season, abandon the pursuit in disgust, and pronounce it a humbug. In travelling through the country the coming summer, observant persons will detect many deserted apiaries and depopulated hives, and on making enquiries, the often repeated reply will be, "O! bee-keeping is played out," or "This climate is too hard for bees."

We are in a position to form an estimate of the general state of the bee-business, and the general characteristics of bee-men. That there have been immense losses sustained from one end of the country to the other, is undeniable, and that this fact will have the effect of utterly discouraging many bee-keepers is equally undeniable. The echo of their discouragement is already making itself heard through a portion of the agricultural press, who can only find one interpretation of the winter's teachings, and that, "Let bee-keeping alone." But it is only a certain class of bee-keepers who are disheartened. It is the negligent, easy-going, partially informed, and half-hearted class, those, in fact, who are unwilling to be at the necessary cost of time, trouble, and outlay, to master their business. Perhaps it is well these should be discouraged. An element of faint-heartedness is better got rid of out of an army, whether of soldiers or bee-keepers. It is very certain that while the class of bee-keepers just referred to, read the lesson of the winter in the one little word "QUIT," another and a better class read several lessons, which combine and coalesce in the word "PERSEVERE." Some of the lessons of the winter may be briefly stated.

1. Extensive loss may usually be traced to neglect or oversight of some sort. A small leak will sink a large ship, and a small oversight will ruin a large apiary. For example, the cool fall weather sets in, Jack Frost appears on the scene, but it is early in the season, Christmas is yet far off, the bee-keeper is very busy, perhaps called from home just when some sudden cold snap comes, the bees are in the condition they were during the summer, not fit for out-door wintering, they become chilled, but though they receive after care it is too late. Or perhaps the bees are put into their winter repository in good season enough, but it is too early to close them up for the winter, they are left opened and exposed, until a sudden dash of winter makes a raid upon them. Our experience is that a chilled hive is like a frost bitten limb, peculiarly sensitive to cold all the rest of the season.

2. In order to successful bee-keeping, it is absolutely necessary to read a good bee-journal. So as to profit by the experience and views of others.

3. Stocks must be wintered according to their condition, and put into certain conditions corresponding with the manner in which they are to be wintered. It is naked folly to leave weak stocks out of doors; they may have a chance for life if early and snugly housed, but left on their summer stands they have not the ghost of a chance. Stocks left out must be strong and well protected. Those put in-doors require attention that the temperature and ventilation may be right.

4. The need of more careful experimenting in regard to the best methods of wintering bees. Cannot some plan be devised, by which every colony

shall have a warm-up, a dry-out, and a fight, some time in mid-winter? We have thought a sheet of cage of white net in a warm room would answer the purpose. It strikes us that if their imprisonment could be shortened, and an opportunity given them to discharge their forces outside the hive, the mortality among them, even during the coldest winters, would be vastly less.

Seasonable Hints to Bee-Keepers.

I again intrude upon your valuable space to urge bee-keepers at this season to carefully examine their hives, and ascertain that each has a prolific queen, as well as a good supply of stores to be used in rearing broods and strengthening the army of workers for the early flowers. Any hive found with less than ten pounds of honey should be fed regularly each evening, commencing with about two table-spoonfuls and gradually increasing to a quarter of a pound daily. Any hive found queenless, if in an old-fashioned box-hive or bee-gum, should be driven out and united with another hive; if in a movable comb-hive, it can be strengthened and built up by giving a frame of brood (if sealed all the better) from another hive that is strong enough to spare it, and in about fifteen days another frame of the same kind, and again, at the end of ten or fifteen days, another frame in which there are eggs or larvae just hatched. It may be asked why not give brood to rear a queen from at once. If they have been queenless only a short time they will rear a queen from the first young brood given them, but if for a long time queenless, they will not rear a queen until after the first brood given hatches; the young bees from which will rear a queen as soon as they hatch in sufficient numbers to construct queen cells, manufacture the necessary jelly, and engender sufficient heat needed to rear queens, and can obtain eggs or larvae of the right age to rear from. Should there be a queen transferred from the first brood given, the hive will need constant watching to be certain of the queen being fertilized and not becoming a drone layer. Should she prove such, as soon as drones begin to fly, kill her and give the hive a frame of young brood and eggs, from which they will rear another queen; and in about twenty days, if the weather is favorable, there will be but little doubt of the hive having a fertile queen. A queenless colony in a box-hive can be saved, but the labor is so great that it will not pay, and it is therefore more advantageous to unite with another colony. Bees should also be fed with rye meal, (ground fine and not bolted,) if obtainable, otherwise rye flour mixed with sawdust, or fine cut straw will answer the purpose; place in shallow pan, and set near the hives in a place sheltered from the wind and rain. The bees will carry the flour into the hives, and use in place of pollen to rear their brood with. Those who desire to change from box-hives to movable comb-hives, should obtain their hives and have everything ready for transferring as soon as first blossoms become plenty. Transferring can be done earlier in-doors, or if weather is very warm and fine, out-doors; but the bees transferred will need feeding, as they will use much honey in repairing their combs and fastening to the frames. The earlier transferring is done, the earlier will the hive swarm, which, to the bee-keeper of careful habits, will more than repay the care and cost of feeding. The careless bee-keeper I would advise to let movable comb-hives alone—they will not be as "lucky" to him as the "old gum" and in the end he will become convinced that "patent hives kill the bees," as many have been convinced that the Mowing Machine kills the grass in the meadow where it is used.—"B." in the *American Farmer*.

Bee-culture vs. Bee-keeping.

"Bee culture" is to be widely distinguished from "Bee keeping." The latter if it imply merely the careless and neglectful possession of one or more hives of unfortunate bees, will invariably be found both uninteresting and unprofitable; for in this, as in all agricultural pursuits, want of care and of that degree of skill which is sure to result from care, will lead to disappointment and failure. But on the other hand it is claimed that bees with good management and timely attention—and they need but little of either, but what they do need they need imperatively, and at the right season—can be made a source both of pleasure and profit.—*Rev. O. Lawson*.

On Extracted Honey and the Proper Manner to put it up for Sale.

The use of movable comb-hives and honey extractors, and the consequent increased supply of honey, has brought into existence new industries, such as the manufacture of glass honey-jars, corks, labels, tin-foil caps, etc. for putting the honey in saleable shape, or packing it for transportation.

The best shaped honey jars, in my estimation, both for sale and for packing with the least waste space, are square jars, containing one or two pounds of honey.

After the jar is corked, press a tinfoil cap over the cork and neck of the bottle with your hand first, and then finish with a leather strap about five-eighths of an inch wide and four feet long, one end of it fastened to the wall. The strap should be wrapped once around the neck of the bottle, and while one end is held tight by one hand the bottle should be passed forward and backward until the tinfoil is properly smoothed down. For my own use, I have made a "horse," so I can sit down to the work of capping my jars, keeping the strap tight with one foot, and using both hands on the jar.

For shipping, jars should be packed tight with saw-dust, and one dozen in a box specially made for the purpose. A bee-keeper should sell by the gross his one or two pound jars of honey to merchants in the country or city, or have it sold on commission until his brand is known. With his label on jars and his brand on boxes, he will soon find a market if he bottles a choice article only. Good honey put up neatly and in small quantities will always bring the best price, and it is my experience that *machine extracted* honey is the preferred article if the consumer is once convinced of its purity.

A manufactured article of Cuba honey finds a ready market in our cities, because it is put up in merchantable shape, i. e. in jars, nicely labelled and styled "White Clover Honey." Now, I claim that the sale of a manufactured article would not be possible if our bee-keepers would only take the necessary pains to bring into market, in proper shape and under their own names, their *machine extracted* honey, which is the only pure honey possible, and if once known to consumers will be the only honey in demand.—*Cor. American Bee Journal*.

The *Christian Union* of Jan. 8, 1873, says: "A man in New Hampshire bought four swarms of bees ten years ago, and now has an income of \$1,200 a year from honey. Go and buy four swarms of bees young man." To which good advice, we add, learn how to take care of them first. Not every man who begins by buying four swarms of bees, ends by getting \$1,200 a year out of honey. Every beginner in apiculture, should buy a good bee book, and subscribe for a good bee journal if he desires to succeed.

REQUISITES OF A GOOD SWARM.—But few in purchasing bees seem to understand the requisites of a good stock of bees or the kind to buy, and many seem to know but little how to select. The first thing, get a hive of medium size, about two hundred cubic inches. If selected in the fall it should contain forty pounds of honey at least with a good swarm of bees, and above all the rest choose a hive so that the queen can deposit a large number of eggs which will be workers. Here is one of the great secrets of bees, one swarm rearing more brood and sending out larger swarms from the same sized hive than another. There is not so much difference in the queen as many have supposed.

Making up Lost Ground.

MR. EDITOR,—You will remember my writing to you last June, saying I had lost all my bees the past winter except two swarms. Well, I bought two and went to work trying to improve them, both in numbers and quality; how well I have succeeded you may judge for yourself. I made me an extractor that I think will beat a Peabody, or Gray & Winder's, and cost me much less, and gently informed my stock that I should expect a good report from them.

I now have on hand twenty stocks of bees, and have taken 227 pounds of fine extracted honey, besides selling a few Italian queens. I did not extract any honey until June 10th. Most of the honey was gathered from *smart-weed*, and the quality is very good. I have sold most of it for fifteen and twenty-cents per pound.

What think you of my progress? If I have been successful, the A. B. J. can claim much of the credit. "Long may it wave."

FRANK W. CHAPMAN.
Morrison, Whiteside Co., Ill.

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The Canada Farmer.

TORONTO, CANADA, APRIL 15, 1873.

The Pea Weevil.

J. W., writes us from Moore, on the subject of this pest. He says:

"For several years the pea weevil (*Bruchus Pisi*) has been exceedingly destructive to the pea crop in this section of country. So much have early sown crops been injured lately, that were it not that peas leave the ground in such fine condition for wheat, many would discontinue the cultivation of the pea crop altogether. Your excellent journal contains articles and discussions on almost every subject bearing on agriculture and horticulture, might I therefore take the liberty of enquiring if yourself, or any of the numerous readers of the CANADA FARMER, know of any remedy that would tend to lessen the ravages of these pea devourers as their name signifies, or any variety of pea that will resist their attacks? Varieties of midged proof wheat were discovered, are there any weevil proof peas known, and if so where are they to be had? Three years ago, there was a mixture of gray or brown peas amongst mine, and scarcely a gray pea was injured, whilst nearly every white pea contained a beetle. Has this been the experience of any of my brother farmers? It may be they are like Colorado beetles that prefer certain varieties of potatoes, but should these fail they take such supplies as nature furnishes, and eat all before them. Late sowing is the only remedy adopted, as the period of laying their eggs seems limited to a certain season. When late sown, however, drought, and mildew, frequently prove injurious to the crop."

NOTE BY ED.—We have observed in the "Crop return for 1872", contained in the report of the Commissioner of Agriculture, that the pea weevil has been very destructive indeed in the western divisions of this province, in some localities the average yield has been reduced to 15 bushels per acre in consequence of the ravages of this creature.

We have frequently noticed the comparative immunity of the wrinkled dark colored varieties of peas from injury by this insect; the immunity however, is by no means absolute, as we have sometimes seen a pea crop of large blue "marrow fats" totally destroyed by the weevil. The sowing of a patch of "David O'ourke's" or other common white variety, alongside of a larger quantity of dark peas, would be an experiment worth trying; probably, if there is anything at all in this idea of preference, the insects'

attacks would be confined to the former, and the latter would be saved.

The great point is to get good seed free from any traces of the weevil. This may be done in some seasons by growing a very early crop, and then sowing the seed thus obtained for a later crop, which is to furnish the seed for the next year. The later crop thus produced will be free from the attacks of the weevil. Of course in a very dry season this is not practicable.

Another method is to immerse the seed peas first before sowing for one minute only in boiling water; this will kill the beetle and not destroy the vitality of the seed. Four minutes immersion would be sufficient to cook the germ of the pea, and prevent its growth; great care must therefore be taken in the employment of this method. The seed infested with these insects should be kept in tight boxes or bottles to prevent the escape of the weevil in the spring; indeed it would be a wise precaution to grind up all infested peas that are to be used only for food, and thus effectually destroy the insect.

Farmers in the western districts of the province would confer a public benefit by trying careful experiments during the coming season with different varieties of peas, and different times of sowing, and letting us hear the results for publication. An experiment conducted in one locality only is not always to be relied upon, as other circumstances may interfere to make it a success or the reverse, and not be detected by the observer. It is only by numerous observations extending over considerable areas that we can arrive at any rule or law in these matters.

Cabbage Pests.

"Would you please inform me through the CANADA FARMER how to get rid of the cabbage pests?"—D. R. S., Picton, N. S.

NOTE BY EDITOR C. F.—Cut a sheet of rather stiff paper—an old newspaper doubled will answer very well—into strips seven or eight inches long by about four wide. Join the ends of each strip in such a manner that the article may assume the form of a common lamp-shade or funnel; place one of these, inverted, that is, small end down, around each plant, sinking it in the soil to a depth of about two inches, leaving the upper portion to form a rampart against the attacks of enemies above ground. Experience has proved that after a few unsuccessful attempts at "sealing," the disappointed assailants will "raise the siege" in disgust. Unleached ashes sprinkled on the plant in the morning before the dew has disappeared has effectually destroyed the leaf worm. To destroy maggots at the root of the plant, dissolve rather less than half an ounce of corrosive sublimate in a pailful of soft-water, and apply at the rate of half a pint or so to each plant, stirring the ground if necessary, to let the application find its way to the roots. Simple as the above remedies may appear, we are assured by a correspondent that he has used them with complete success, after every other means has failed. The only objection to the use of the corrosive sublimate is the fact that it is a deadly poison, and must be handled with great caution. We think that a weak solution of sulphate of iron (copperas) in water, say one ounce to the gallon, and applied in the same manner should answer the purpose quite as well. Try it and let us know the result.

The "green worm," to which our correspondent referred in his note, is no doubt the larva of the English Cabbage Butterfly (*Pieris rapae*); it may be kept in check by sprinkling ashes and salt liberally over the affected plants.

We know no better remedy for the little turnip flea-beetle (*Haltica nemorum*), than that employed by our correspondent, viz. knocking the insects off into a pan of hot water; it is troublesome but very effective.

The Best Green Crop.

A correspondent at Drummondville writes us to know if lucerne, sainfoin, or vetches can be safely cultivated in Canada to resist the frost of winter and also on other points. In reply we have to say that neither of these crops will answer for spring feed. Lucerne has yet to be tested in Canada on such a scale as to determine, beyond doubt, its value as a crop here, and its power to resist severe frost. The same may be said of sainfoin and winter vetches. SPRING VETCHES alone, or with oats, or with oats and peas, are admirable summer feed and give a large yield. There is a Canadian or wild vetch, very similar to a wild pea that grows on the prairies in the west; we have no doubt this plant would prove valuable. We have a few stalks of this variety that come every year in our garden, and they appear hardy and prolific. The best mode of treating new land, full of stumps, that cannot be ploughed, is to sow Swedish turnips in June, dragging the land well first, passing the harrow in all directions then sowing the seed—about one pound to an acre—and bush-harrowing it well in, passing the bush over the land three ways so as to catch all the land that would be missed on account of the stumps if less often bush-harrowed. Chicory can be prepared at any seedstore, and the plant does well in Canada. Vast quantities are grown in many sections as a substitute and addition to coffee, the price is usually about \$50 to \$70 a ton of dried cut roots. There is, however, a great deal of labor attending its cultivation, and when once the roots get into a piece of land that suits them, they will endure more or less for years; any small piece will grow. They are very similar to the common dandelion, both botanically and practically; but, of course, are much larger, as a field crop they afford no foliage for food, that will pay to grow, and the winter will not kill the root.

Soda-Ash for Wire-Worms.

G. M., MEADOWVALE, writes to know whether soda-ash is a good remedy for wire-worms. We have no opportunity of practically testing the fact, as to whether soda-ash applied to green crops will prove efficient as a destroyer of wire-worms. As there is no fertilizing effect likely to be produced—outside any benefit derived by the crops from the destruction of these pests—we should consider the remedy an expensive one. We have known the refuse of soap factories applied, and as these consist of lime, and soda, with some animal matter, it would appear to be likely to be valuable, but although the application and experiment referred to, cost nothing but the hauling the refuse away, which was applied in large quantities, we believe the application was a failure, as it was never repeated. Salt and lime will be more likely to be efficient, but that must be applied at this season, or during the coming spring, as all practical tests go to prove, that the benefits derived from this mixture, are comparatively inert, unless these substances are thoroughly amalgamated, and decomposed to a certain extent, by remaining in contact for at least three months. Opinions differ greatly as to the principle on which this compost acts, and why three months' amalgamation is requisite, before applying, but the facts are as stated.

Prolific Cows.

The maternal ancestor, "Old Nobby," 25 calves in 15 years, viz. 6 single, 8 double, and two treble. One of her heifers, "Venus," dropped 14 calves in 7 years, viz. 3 single, 4 double, and one treble. "Vesta," the twin sister of "Venus," had twins to begin with—all of which is not bad for the down-trodden cows of old England, and it ought to settle the question, heretofore a matter of discussion, and a source of inquietude, "are twin cows barren?"—*Mark Lane Express*.

Our English contemporary is in error, in supposing the notion to prevail that "twin heifers are barren." We have seen it stated that twins, when one is a heifer and the other a bull, the heifer will not breed or in other words is "barren." This is not always true, for "Brighteyes," bred by Mason, in England, dropped 6 calves, though her mate was a bull. "Chilton," (1861), bred also by Mason was twin brother of "Brighteyes." The female twin of a bull has been called a freemartin, a hermaphrodite according to the technological nomenclature.—*Boston Cultivator*.

Short-horn Intelligence.

The short-horn season of 1873 has opened with considerable vigor, and the prospect of large demand and fair prices for good high-bred animals has rarely been better.

On Wednesday, 9th April, the large joint sale of Mr. W. B. Dodge and Mr. C. C. Parks of Waukegan, Ill., came off under the management of Col. Judy. Sixty-three cows and heifers, and twenty-five bulls were on the catalogue. The list of prices obtained has not yet reached us, but we understand that the result as a whole was highly satisfactory. The animals offered were of very high character.

On the following day, 10th April, a selection of 22 cows and heifers and 10 bulls from the very high-bred herd of Mr. George Murray, of Slausondale, Racine, was brought to the hammer, when the following large prices were obtained:

Cows.	
1 Minna Dole, 10 years.....	\$ 650
2 Minna 3rd, 9 years.....	555
3 Carlotta, 8 years.....	605
4 Amelia Van Meter, 7 years.....	670
5 Blossom of Promise, 7 years.....	700
6 Mazurka 20th, 7 years.....	1,400
7 Clotilda, 7 years.....	690
8 Mazurka 23rd, 7 years.....	1,775
9 Vestris, 6 years.....	650
10 Rowena, 6 years.....	690
11 2nd Lady of Racine, 5 years.....	1,700
12 Forest Queen, 4 years.....	1,280
13 3rd Louan of Slausondale, 4 years.....	1,325
14 Meta, 8 years—not offered.....	
15 Moss Rose 2nd, 2 years.....	700
16 Mistletoe 6th, yearling.....	525
17 Valeria, 2 years.....	1,325
18 Forest Lady, yearling.....	850
19 Moss Rose 4th, yearling.....	610
20 Moss Rose 5th, yearling.....	540
21 4th Lady of Racine, yearling.....	750
22 Meta 3rd, calf.....	485
Total for 21 females.....	\$18,550
Average.....	\$883
Bulls.	
23 17th Duke of Airdrie, 6 years.....	\$2,300
24 Mazurka's Airdrie 2nd, yearling.....	270
25 Cardinal, 2 years—not sold.....	
26 Minos, yearling.....	775
27 Lord of Lorne, yearling.....	414
28 Cherry Duke, yearling.....	500
29 Amateur, yearling.....	305
30 Cherry Duke 2nd, yearling—not sold.....	
31 Rowena's Airdrie, calf.....	270
32 2nd Lord of Racine—not sold.....	
Total for 7 males.....	\$4,834
Average.....	\$690
Total for 28 animals.....	\$23,384
Average.....	\$835

In England, on the 19th March, Mr. John Thornton sold by auction the entire herd of the late Lord Southampton—when 41 cows and heifers averaged \$223 each, and seven bulls \$166 each—or a general average of \$216.

On the day following, Mr. Thornton sold the well-known Rotherthorpe herd—when 24 cows were sold at an average of \$219, and nine bulls at an average of \$239—or a general average of \$225.

Bell's Weekly Messenger, of 24th March, announces that the famous Bates short-horn herd of Col. Towneley is to be sold on the first of May. There are 35 cows and six bulls.

The same paper announced that on the 3rd April, the Booth portion of the first-class herd of Mr. Brassey, M. P., of Preston Hall, would be offered at public sale, by Mr. Thornton. Thirty-one cows and heifers, and seven bulls were included in the catalogue. Speaking of this herd, the Messenger says:—"We learn that the personal properties of the Preston Hall short-horns for sale are well 'up to the mark.' Of their breeding we need not say much, because much has been written to small purpose, if the names of the sorts do not denote the character of their blood. In the one kind it is chiefly Booth, super-abounding upon a Waterloo-Bates foundation; in the other a Booth foundation, mixed centre, and virtually Booth

superlayer. The principal sire of the young stock calved at the Preston Hall farm is Mr. Oliver's Cherry Grand Duke 3rd, whose pedigree shows the grand old Seventh Grand Duke, preceded by the three Grand Dukes of Springfield Hall, upon the Cherry stock. Two of the produce of the sixteen purchase, are by Mr. Torr's bulls, and one is by Mr. Leney's Grand Duke 15th. The cows and heifers are breeding to the famous Wetherby bull, Second Duke of Tregunter, the son of Fourth Duke of Thorndale and Duchess 9th, whose purchase-price as a calf was 500 guineas to Mr. Bowly, who re-sold him at 900. The bulls at Preston Hall are from the two Aylesby lines already mentioned, from the Springfield Bijou, a Grand Duke cow, daughter of the beautiful Buttercup, of a former Holker herd, and from Earl Ducie's family of Louisa by Cramer."

We learn from the Melbourne Argus, of a late date, that Mr. Richard Morton of Derrimat, Victoria, a noted importer and breeder of Durham stock in that colony, had just landed at Melbourne, two young bulls of high lineage, which arrived in excellent condition. Oxford Cherry Duke, a rich roan, 15 months old, bred by Lord Penryn, is by 4th Baron Oxford (25580), dam Cherry—Duchess 13th, by 3rd Duke of Wharfedale (21619). The first two calves, sold, by 4th Baron Oxford, made 1,600 guineas and 1,055 guineas, and the only female of the Cherry Duchess family sold during last year made 805 guineas at Lord Dummer's sale in September last. The other youngster, Earl of Geneva, red with a little white, 14 months old, was bred by Mr. R. P. Davies, and is by 9th Duke of Geneva (23891), dam Kirklevington—Duchess 2nd, by Duke of Athelstane (21562). 9th Duke of Geneva cost 950 guineas in America, and 5th Duke of Geneva, from an own sister to the g. g. dam of 9th Duke of Geneva, made 1,650 guineas at auction in September last, the highest price ever paid for a short-horn animal. With the above also came two bulls. In lineage they are own brothers, and in no respect inferior to the foregoing:—Baron Colling 2nd, red, calved January 12, 1871; bred by Colonel Towneley; is by Baron Oxford (23375), dam Lady Butterly 2nd, by 6th Duke of Airdrie (19302), imported to England from America. Baron Oxford was purchased in 1857, by Colonel Towneley, for 500 guineas and his dam was purchased by the Duke of Devonshire, at the same sale, for the sum of 600 guineas. Baron Colling 2nd, has gained four first prizes; he was also one of seven that gained two cups for the best lot of seven short-horns. Baron Colling 3rd, red, calved January 30, 1872, was also bred by Colonel Towneley, and is own brother to Baron Colling 2nd.

Coming nearer home, we learn that Mr. George Brown sold last week from his Bow Park herd, twenty young short-horn heifers, to Mr. Capron, of Chicago, for shipment to Utah and California. The lot is a very fine one, and it is understood that the price was \$5,000.

Impure Clover Seed.

At the Belford (England), Civil Court, on 10th March, the case of Brightman v. Green was tried before Lord Chief Baron and a common jury. This was an action for breach of warranty and fraudulent misrepresentation in the sale of a hundredweight and a half of clover seed as "Best English," at 55s. per cwt. Mr. O'Malley, Q.C., Mr. Metcalf, Q.C., and Mr. Graham were counsel for the plaintiff; Mr. Bulwer, Q.C., and Mr. Perkins for the defendant. It was alleged on the part of the plaintiff that the clover seed contained a large admixture of "dodder" seed, which, though imperceptible to an ordinary purchaser, was known to be present by the defendant, from the fact that he himself had grown the crop from which the seed was derived, and knew it to have been largely intermingled with the dodder plant. It was not denied that the effects of dodder are very

disastrous to a crop among which it entwines itself, but it was contended that there was no warranty or fraud, and that dodder is a parasite, the propagation of which is wholly unaccountable to the most experienced agriculturists. The case excited considerable interest among the farmers and seedsmen of this and the adjoining counties, owing to the prospects it might afford to the farmers of being able to recoup themselves on the seedsmen for the part played by dodder in the failure of the clover crops of the last few seasons. The claim in the plaintiff's particulars amounted to £202 10s. The jury found for the plaintiff—Damages, £50. His Lordship reserved leave to the defendant to move to reduce the sum to 46 7s. 6d., the price paid for the seed.—North British Agriculturist.

R. Baker's Short-horn cow, "Joan of Arc," gave in seven days, commencing July 3, 1872, 378 lbs. milk, from which was made 15 1-16 lbs. butter. She was tested for Ohio State Fair in 1871, and gave during the season, 9498 lbs. milk, and 405 1-3 lbs. butter. Daily average, 323-16 lbs. milk and 16-16 lbs. butter.

HIGH-PRICED BUTTER.—Wm. Crozier, near New York city, informs the Country Gentleman that he has contracted with a firm in New York for his butter during the season at 70 cents per pound. His cows are Jerseys. We are not informed what number he keeps, but his sales of butter in February amounted to \$611.

CLOVER AND GRASS SEED should be sown early. Rain should not fall on the ground after the grain is covered before the grass seeds are scattered. Plaster is useful to young clover, and it probably pays to sow it on the spring grain. Where the drill is used in sowing the grain, the grass seed attachment should be with it and the whole job done at once.—Farmer's Union.

SITTYTON SHORT-HORNS.—The annual sale of short-horn bulls and heifers at Sittyton was to take place on the 27th March, when upwards of fifty animals were exposed to public competition. Mr. A Cruickshank's herd is favorably known as one of the largest and most valuable herds in the United Kingdom. Mr. John Thornton was to sell two English short-horn herds on the same day—namely, the herd of the Rev. Thomas Staniforth, at Storrs Farm, Windermere; and at the same farm part of the herd of Mr. H. J. Gibbon, of Holmescales, Milnthorpe.

Prof. Tyndall illustrates the value of a single potato by supposing that every potato in the world but one were destroyed; that one would contain in itself the possibility of again stocking the world with an invaluable article of food. If one potato would produce, when planted, only a crop of ten potatoes, in ten years the total product of the produce of this one potato would be equal to ten thousand millions, which would be sufficient to stock the whole world with seed. The real value of that single potato, then, would be such that it would be better that the City of London or New York should be totally destroyed than that tuber should be lost to the world.

PRIZE STOCK MANAGEMENT.—Mr. Powell of Eglwysmunyd, England, last year took the first prize, £150, from the Royal Agricultural Society for the best winter management of stock. His mode is thus given:—"The cows drop their calves in autumn and winter, and the calves are allowed to suck for four or five months. They are confined five or six together in boxes partitioned off, and go to the cows in the yard twice a day. They are given, as soon as they will eat it, some of the best hay, pulped roots, and a small quantity of oats and pea-meal. The cows are fed straw, rough hay and sliced roots; and on this feed keep always fat. When the calves are weaned the cows are milked and butter and cheese are made."

A remarkable fact, proving at once that insects are endowed with memory, association of ideas, and the sense of hearing, has been recorded by M. Gouraud, the author of the valuable observations on the stridulation of insects, before referred to in treating of their noises. He kept for several days a praying mantis (M. religiosa) in a box, and fed it with flies. On first placing it in its new abode he irritated it with a pen, and at the same time gave a slight whistle. Apparently fearing an enemy, it put itself in a state of defence, reared up its long thorax, placed its fore feet as if to seize its prey, and half expanded its wings and elytra, rubbing its abdomen repeatedly against their sides, so as to produce a noise like that of parchment. "From the first moment (continues M. Gouraud) to the last day that I kept it, every time that I visited it and gave the same slight whistle it assumed its defensive attitude, and did not quit it till it judged the danger past."—(Ann. Soc. Ent. de France, x. bull xviii.)

Scarcity of Horses in England.

Mr. A. G. Church, the general manager of the London General Omnibus Company, publishes some statistics which go to show that there is a scarcity at any rate of the horses required for working London omnibuses. The average price paid by the company last year was \$25 per horse in excess of that paid in 1871. Here are Mr. Church's figures:—In the last 12 years the London General Omnibus Company (Limited) have purchased 12,024 horses for their business; the average prices in each year have been as follows:—1861, 25/13s.; 1862, 25/2s. 7d.; 1863, 23/9s. 7d.; 1864, 23/18s.; 1865, 23/18s. 7d.; 1866, 23/15s. 7d.; 1867, 23/11s. 4d.; 1868, 23/5s. 10d.; 1869, 23/17s. 9d.; 1870, 21/3s. 8d. (\$121); 1871, 27/18s. 5d. (140); 1872, 32/17s. 8d. (\$165). Mr. Church proceeds: "Until 1870, the company had not purchased a single foreign horse, and had found no difficulty whatever in obtaining as many horses as they required, exclusively from the English and Scotch markets. From that date, owing, no doubt, chiefly to the demand arising from the continental war, the supply gradually decreased, and in the early part of 1871 it almost entirely failed, notwithstanding an increase of fully 33 per cent in the price offered. At the present time, and during the past 18 months, the company have, with very few exceptions indeed, obtained all their horses from France, and many of the English dealers who formerly supplied them with horses have been entirely driven out of the trade through their inability either to procure horses in the United Kingdom, or adapt themselves to the foreign trade. I believe that on inquiry it will be found that in London, at the present time, the number of working horses is very greatly below that of any previous time during the last 10 years."

Show and Sale of Bulls at Perth Scotland.

On March 12, the annual sale of pure bred stock and show of short-horned bulls took place at the Perth Auction Mart, and the success which attended it was very great, as might have been expected. The stock was of a very superior quality, being almost exclusively pure bred. The show was the largest and best of its kind in Scotland; and the attendance of agriculturists was exceedingly numerous. The competition was very keen. The judges—Messrs Campbell, Kinellar, Easton, junr., Torry, and John McLaren, late factor to Lord Kinnaird—awarded the first premium, a silver cup, value ten guineas, to Mr. Arklay, of Ethiebeaton, for the rich roan "Prince Alfred," which was sold to Mrs. McGowan, Callander, for 55 guineas. The second prize, a silver cup, was gained by Mr. Lyall, Old Montrose, with "Royal Dane," which was sold to Charles H. Drummond Moray, Esq., at 35 guineas. The third prize was gained by Mr. Arklay with the red bull "Ivanhoe," which was sold to Mr. Langland, Balkembark, Dundee, for 54 guineas. About twelve o'clock the sale began, and was ably conducted. The bidding was spirited. The animals sold at prices ranging from 13½ to 55 guineas. During the whole time of the sale the mart was crowded with buyers and others from all parts of the country. The entries for the sale comprised 55 pure bred yearling short-horn bulls, 6 two-year-old short-horn bulls, and 4 short-horned heifers, also 12 well-bred yearling short-horned bulls. —*North British Agriculturist.*

Value of Agricultural Papers.

At the last fair of the Oregon State Agricultural Society Col. David Taggart delivered an address, in which he bore testimony to the value of agricultural papers as follows:—There are one or two points I would like to impress forcibly upon your minds. Every farmer in Oregon, every farmer in the United States, and every farmer in the world ought to take at least one agricultural paper, and read it, and make every capable member of his family read it. Every man who owns or cultivates a rod of ground ought to take one. Frequently a little paragraph of half a dozen lines will be worth more to him than twenty years' cost of the paper. It is a great help to any man to have the benefit of other men's experience to add to his own, and that in precisely what he gets by reading excellent papers. And not only this, but he is likely to get the experience of the brightest and ablest farmers in the country, for these are the men who usually contribute to them. They have done more for the improvement of farming than even exhibitions. I will venture to say if there were no such publications you would have no such agricultural societies, and no shows. The farmer is sure to get behind who does not read them.

Sir John Lubbock's Pet Wasp.

From the *Daily Telegraph*, London, England.—One of the most curious attendants this year at the gathering of the British Association in Brighton, was a little gentleman in brown overcoat, with black and yellow nether garments, wearing a sharp sword poisoned at the tip. We are inclined to think that, next to Mr. Stanley, this visitor might be called by far the most remarkable and best worth attention among all the assembled notoriety. It was Sir John Lubbock's pet wasp; and the report which would naturally be paid to any friend of the benevolent *swarm* who has given London its new holidays, was really due to this insect on its own account. Captured in a nest of soft grey paper in the Pyrenees, the wasp was the very first of its species that had ever received an education. Sir John exhibited it to the members of the Association with just pride, as a proof of what kindness and patience can effect upon the most unpromising creatures, and even Mr. Forster might have wondered to see it come out of the glass bottle when it lives, eat sugar from its master's fingers, allow him to tickle its striped back, and fly round and round his head, returning always to its home in the bottle. At first, says its distinguished educator, it was "rather too ready with its sting." But now it never thinks of unscathing the tiny rapier at its tail, and nobody who saw the insect could doubt that its nature had been greatly changed.

Planting Trees for Shelter.

Mr. W. Roy, Owen Sound, writing to the Fruit Growers' Association, says, I have planted a few trees for shelter, but not half as many as I ought to have done. I consider planting for shelter of great importance in our climate. Let every man who has a garden and orchard plant shelter trees, and plant abundantly of Norway Spruce and Hemlock, either detached, in groups, or in hedges. These two varieties are always "a thing of beauty," in summer or winter. Don't overlook the Austrian and Scotch Pines. Although of slow growth, our children will rise up to bless us for planting them. The Arbor-Vita makes a fine hedge and is very easily transplanted. There is no difficulty in getting it to grow.

It is high time the people of Ontario should turn their attention to beautifying their homes. What a powerful influence such attractions have in refining the family, and inviting the affections of our sons and daughters to the old homestead.

A Plague of Butterflies

Is a rare occurrence. A short time ago, however, the town of Florence was invaded by a prodigious quantity of these insects. All the distance of the Longarno between the Piazza Manin and the Barriera and in all the adjacent streets the passage was almost obstructed by an extraordinary quantity of butterflies that had swarmed in such thick clouds round the gas-lights that the streets were comparatively dark. Fires were immediately lighted by order of the Municipality and by private citizens, in which the butterflies burnt their wings, so that half an hour afterwards one walked on a layer formed by the bodies of the butterflies an inch thick!!! They were of a whitish colour, and some of the streets appeared as if covered with snow, at least so say the Italian papers. —*Nature.*

At a late meeting of the Herefordshire Chamber of Agriculture, Mr. Duckham informed the members that the following returns were an incomplete estimate of the animals affected by and died from the foot-and-mouth disease in Herefordshire:—Attacked—cattle 29,202; sheep, 86,885; pigs, 6231. Died—cattle 1619; sheep, 1287; pigs, 1377.

The salmon fishings on the Tay adjoining Newburgh have greatly improved during the last fortnight. For the last week 155 salmon were landed on Mr. Dunn's stations on the Tidal Waters; thirty-three on the "Little Bank"; seven on Crombie Point, and six on the "Haggis." Many of the fish were upwards of 30 lbs. each. Prices have slightly improved in the London markets. —*Farmer 17th March.*

The arrangements for the show of the Royal Horticultural Society, of England, which takes place at Bath this year, are progressing favorably. The schedule of prizes will be shortly published, and will be far in excess of any previous exhibition of the Society. Applications will be made with a view to induce the Prince and Princess of Wales to inaugurate the opening on the 24th of June, and there is probability of success.

An application for a rise of wages to the amount of 20 per cent. by the Warwickshire farm-laborers has been refused by the farmers. Another great spring strike is therefore considered imminent, says the

Daily News. The Union offers to accept arbitration. At a meeting of laborers held on Monday, at Leamington, Mr. Arch in the chair, a letter was read from the London Trades Council disowning the reported attempt to form another union.

TO PROTECT LEATHER FROM THE ACTION OF AMMONIA IN STABLES.—Long continued observations show that harness and other leather exposed to the action of ammonia continually given off in stables becomes weak and rotten sooner than other leather. Even when care is taken to protect them with grease this takes place. Prof. Artus recommends the addition of a small quantity of Glycerine to the oil or fat employed in greasing such kind of leather, asserting that it keeps it always pliable and soft.

GENERAL TESTIMONIAL TO MR. GEORGE HOPE, FINTONBARNS, SCOTLAND.—A number of gentlemen have formed themselves into a committee for the purpose of presenting Mr. Hope with a testimonial "for his eminence as an agriculturist, his high personal character, and his public services during a long period of years in the promotion of wise and beneficial improvements." Circulars are being issued both to the members of the Highland Society and the Scottish Chamber of Agriculture. Parties desirous to subscribe may communicate with either of the two honorary secretaries, Mr. Alexander Tod, St. Mary's Mount, Peebles, and Mr. James Melvin, Bonnington, Ratho. We are informed that the secretary and treasurer, Mr. Howard Blyth, has already received a number of subscriptions, varying in amount from 5s. to 10 guineas. —*North British Agriculturist.*

HOPE'S GREELEY'S BARN.—Mr. Greeley says: "My barn is a fair success. I placed it on the shelf of my hill, nearest to the upper (east) side of my place, because a barnyard is a manufactory of fertilizers from materials of lesser weight: and it is easier to draw these down hill than up. I built its walls wholly of stone, gathered or blasted from the adjacent slope, to the extent of four or five thousand tons, and laid in a box with thin mortar of little lime and much sand, filling all the interstices, and binding the whole in a solid mass, till my walls are nearly one solid rock, while the roof is of Vermont slate. I drive into three stories—a basement for manures, a stable for animals, and a story above this for hay, while the grain is pitched into the loft above, from whose floor the roof rises steep to the height of 16 or 18 feet. There should have been more windows for light and air; but my barn is convenient, impervious to frost, and I am confident that cattle are wintered at a fourth less cost than when they shiver in board shanties, with cracks between the boards that will admit your hands. No part of our rural economy is more wasteful than the habitual exposure of our animals to pelting, chilling storms, and to intense cold. Building with concrete is still a novelty, and was far more so ten years ago, when I built my barn. I could now build better and cheaper, but I am glad that I need not. I calculate that this barn will be abidingly useful long after I shall be forgotten, and that had I chosen to have my name lettered on its front, it would have remained there to honor me as a builder long after it had ceased to have any other signification." —*Utica Herald.*

SOURCES OF MEAT SUPPLY.—The London "agricultural" correspondent of the *Independence Belge* writes that the more the question of food supplies is considered in England, the more does the conviction grow of the necessity of large importations of live cattle. Sources of supply have been sought in Buenos Ayres, in Australia, and in the pampas of South America. But the experiments have failed hitherto, owing to the greatness of the distance. The United States are therefore reverted to, and the enormous capacities of the western and south-western districts for rearing cattle are being closely examined. In Texas the herds are innumerable. North of that State are the vast pasture grounds of the Nebraska, Kansas, Colorado, and the Wyoming. Texan cattle are very bony, but, crossed with Durhams, produce a fleshy animal, the meat of which is excellent. Experiments of this sort have been tried in Nebraska, and yielded the best results. Breeding by selection is being cultivated there. Now all these animals may be brought by railway in three days to Quebec, Boston, and New York. Arrived there, there are no great obstacles to their transport by sea. The voyage is short, there are none of the inconveniences of a torrid temperature, and steamers constructed with due regard to ventilation could convey large numbers without injury to the health of the cattle. Such is the plan proposed by one of those Englishmen, who in their own travels are not alone occupied with their own amusement, but are thinking of what may benefit their country. Not only England, but all the industrial countries in which meat is becoming dear and scarce are interested in the subject.

The Horse and Stable.

Breeding of Horses.

It is an old saying that "it is a long time to the saddling of a foal"—which implies that several years must elapse between the period of birth and the time when the animal can be made available for work. In breeding horses, attention requires to be specially bestowed upon the kind of animal expected to be produced. As a rule, the breeders of horses bestow the greatest amount of attention in the selection of a stallion. No sire which has any hereditary lameness should be used in the stud. The same applies to mares. Any hereditary defects are almost certain to reappear in the progeny. It is very important that both the horse and the mare should have well-formed feet, and that the joints should be large and free of any defects. The most common defects in the hock-joint are spavins and curbs, and no animal lame from either of these malformations should be put to the stud, otherwise the breeder will most likely be disappointed when the animal is put to work. Breeders and owners of horses do not usually attach sufficient importance to the foot of the horse. So long as the horse is employed on the farm the importance of good feet is not so apparent, but when the horse is used on a macadamised or paved road the necessity for well-formed feet to support the heavy animal becomes more apparent.

We cannot advise farmers as a class to attempt to breed thorough-bred stock for racing purposes. The breeding of race-horses is now generally undertaken either by companies having a large command of capital, the colts being usually sold annually in autumn, when they are at the age of from fifteen to eighteen months.

In breeding horses for the saddle and light harness, it is generally advisable to select for a sire a thorough-bred horse who is stout and sound, although there have been very good saddle-horses produced whose sires were what are called "half-bred." The mare selected for breeding should also be stout, with good action, and sound in wind and limb. The market value of all horses for quick work depends greatly upon speed. This applies alike to roadsters, hunters and horses suitable for light harness. The animals put to the stud should be of full average size, both as regards height and girth, but, above all, we repeat, soundness and good action are indispensable.

In breeding horses for the farm, as size is becoming every year a more important condition as to market-value, this should not be overlooked in the selection of either a sire or mare. If the mare is large, size in the sire is not so important, as the produce will most likely arrive at the standard height of the breed. Power in draught depends more upon stoutness and courage than weight in the collar—although for the working of heavy lands, weight in the collar is a very important condition in the farm horse, and when sold, is usually an important element in the price. The breeders of good-sized cart-horses are generally the best paid, there being less outlay involved, while the produce can usually be sold when under three years of age, at relatively high prices, leaving a fair return for the outlay.

In breeding horses, color is not so important as in horses intended for light harness. At one time, grey was a much more common color in all breeds than it has become in the last few years. Comparatively few thorough-bred horses are now of this color. Browns, bays and chestnuts are always preferred, although some of the most successful horses on the turf have been chestnuts, with more or less white. Both grey and chestnut comes directly from the Arabian horse. Of the horses imported in India a large number are greys. At the beginning of the present century, grey was a very common color in the Clydesdale horse, but sires of this color are now generally disliked from the common belief that the color of the foal can be traced to the sire; and grey horses, when they advance to the age of eight or ten years, are not so speedily disposed of at high prices as browns, bays, or blacks.

High-bred horses, particularly those bred for racing purposes are usually foaled during the first months of the year, as when brought out as two or three year-olds, they are believed to have some advantage over colts which have been foaled in April or May. Mares employed in farm work may be put to the horse by the end of April or beginning of May. The period of gestation varies, seldom exceeding eleven months, and it is desirable that the foal should be dropped when the weather is comparatively mild and grass is becoming plentiful. The mare should be served on the ninth or tenth day after foaling. Previous to foaling the mare should be kept in a warm but well-ventilated house, and if she is confined in a roomy box, there

is less danger of accident to the foal. She should be well fed, receiving oats and hay. After the foal is dropped, the shoes of the mare may be removed, and if she has access to a small paddock or grass field during the day, both foal and dam should be removed in the afternoon to the box till the weather becomes mild, when they can be kept night and day in a pasture-field. London [England.] *Farmer.*

How to Raise Good Colts.

In the first place, have a good mare of mature age (five to seven years old, according to the breed); sound, having a good constitution and ancestry; large, not weighing less than 1,000 pounds in January; deep and broad through the pelvis, and rather small in girth around the chest, indicating good milking qualities; broad and muscular limbs, flat bone from knee down to posterior; sound and perfect feet; high and thin withers, prominent eyes, wide apart; bony head, good left action; disposition and a little spirit will not hurt her. Now cross her with a sire of the same characteristics, except that he should be heavier before and lighter behind. If the mare is too long-bodied and short-legged, cross with a sire rather the reverse, having too short a body and too long legs, and so remedy any of the defects the mare may have, on the principle that like begets like.

Be sure and remember that if the mare is not a good milker, "it is useless to try and raise good colts from her. Good horses may be raised from a poor milker," or rather colts that may eventually become good horses; but, as nature provided but one chief food for colts, if they cannot get that, they cannot thrive, but will only stay along, until they become old enough to thrive on other food, which is so late that they rarely attain to what they would have been.

The mare may be worked during pregnancy regularly or otherwise, if not strained, heated, overdone, or exposed so as to take cold; she should have what good hay, in winter, she will eat up clean, and two to four quarts of oats per day, or its equivalent in other feed, and if worked should liberally be fed. After spring work is done, she should be put out to pasture, and taken up nights for awhile, especially stormy or cool nights. After she has run ten and a half months she should be watched every day, and after milk, or wax, is seen on the end of her teats, she should be seen every hour, as for the want of a few moments' care, just at the time, many colts have been lost by suffocation, the case covering the colt not giving away soon enough.

Keep the dam on light food for three or four days, until the danger from inflammation has passed, after which she should have good pasture feed, with water and salt plenty, and not much work, and be careful not to overheat her, or fatigue the colt by long and fast driving, or from work in hot weather. If it is not necessary to use the mare quite frequently and hard, let the colt suck from four and a half to five months. Before weaning, for a few weeks, begin to teach him to eat a little grain, and after he is weaned, give him a few handfuls of grain, or meal, daily. He should be haltered before weaning, handled kindly, but in such a manner that he will know that his master is the strongest.

What man has done, man can do again, and it is high time that raising colts from unsound, laid-by mares was done with, or raising them on the "starvation principle," working the mares hard, and feeding on air puddings or fence boards, as though she could manufacture good colt feed and plenty of it, whether suitable materials and plenty of them, were furnished or not. Many colts weigh as much at twelve months as at four months old, from want of suitable care and food after weaning time, by which they often become poor, lousy, and unhealthy, and are as good as spoiled for life. Good horses may be raised with profit, while poor ones can only be raised at a loss.

It certainly behoves a farmer to see that his young stock, as well as his old ones, are kept thrifty and growing. —"Novice," in *Farmers' Union.*

Early Foals.

Breeders should bear in mind that an early foal is every way preferable to a late one. The reasons are obvious. The early foal gets a good start and is the better able to withstand the rigors of its first winter, without being stunted in its growth. It has acquired a good degree of strength and growth before the season of torment to all horses, fly times approaches, and is the better able to pay the tribute which these pests exact from all horseflesh, both old and young, in the stable and in the field. Foals that are dropped late in the spring, or in the early summer months, are not unfrequently killed outright by these

pests, and they are always more or less checked in their growth from this cause. Then, the cold of winter coming on before the young thing has learned to eat well, or before the system has become adapted to solid food, completes the work that the merciless flies began, and a stunted, dwarfed pony is the result. On the other hand, an early foal may be weaned in time to become well accustomed to solid food, and can easily be kept in good condition during the first winter, coming out in the spring strong and vigorous. If the farmer has a good warm barn, his foals may safely be dropped in February and March. After foaling, at this season of the year, the mare should be fed on chopped feed, with a good supply of ground oats and wheat bran mixed. This will produce a bountiful supply of milk, and when the spring work comes on, the mares will be in condition to put to the plough, and the foals are old enough to follow the mare, or be left in the stable or pasture for several hours at a time. This is an important consideration for the general farmer, who depends upon his mares to do the work of his farm, and it should not be lost sight of. But aside from this advantage, there is no doubt that the early foal will always make a larger, stronger animal than the late one. In most of the Middle and Western States, it would be decidedly preferable to have foals come in October, and then carefully house and feed them with the dam in severe weather, rather than to have them dropped from the middle of May to the middle of September, and exposed to the merciless puncturings of the flies that will kill them by inches. We are satisfied that a little reflection will convince any intelligent farmer that our advice to raise early foals is sound, and should be followed more generally by farmers — *Live Stock Journal.*

Gentle Words for Horses.

If horses were next thing to deaf, there would be an excuse for the shoutings and yellings so generally indulged in, but they are not, and therefore need not be spoken to so loudly and harshly. The ear of a horse is very sensitive, and, save in exceptional cases, it is possible to control his motions by a command given in a moderate tone of a voice. A horse is a teachable animal and is always affected by kind treatment. The fact of the matter is that, if kind words and gentle treatment throughout were given to these noble animals instead of oaths, curses, and blows, we should find their docility greatly increased. Just imagine, if you will a gee! or whoa! uttered in a tone sufficiently loud to be heard half a mile distant, and this command given to an animal within five or ten feet off the party giving it. Wherein consists the necessity for it? Why not resort to more rational and certainly more pleasing means? Why not speak in a moderate tone? This is all that is required. The horse, if not deaf, can hear it, and will as readily obey as if given in thundering tones. One of the best managed teams ever seen was controlled by the driver without the indulgence of this unmusical yelling. The driver rarely ever spoke above his ordinary tone of voice, and yet his horses laid into their work with as much willingness and apparently greater earnestness than if they had been driven to it by fearful shoutings and blows. The horse is an intelligent animal. None of the brute creation more readily appreciate kind words and kind treatment. Such facts should be considered always by those who have the care of these animals. — *Scientific American.*

How to Treat a Nice Horse.

"Eli Perkins," writing from Saratoga, last summer, said: — "Some English grooms here are teaching the 'Yankees how to take care of a horse. To-day I asked one of these grooms, who has spent twenty years in the stables of royalty, what he had to say about our American way of taking care of a horse. 'Why, sir,' said he, 'you don't take good care of your horses; you think you do, but you don't.' 'Why?', I asked. 'Because when a horse comes in all wet with perspiration, you let him stand in the stable and dry with all the dirt on. In England we take the horse as he comes in from a drive and sprinkle blood-warm water all over him, from his head to his feet; then we scrape him down and blanket him, rubbing his legs and face dry. Thus, in an hour he is clean and dry and ready to take a good feed; while, with your way, he will stand and sweeter for hours, and finally dry sticky and dirty. Our horses never founder and never take cold. We never use a curry-comb. You scratch your horses too hard. The only care necessary is to have the water not very cold, then bathe them quick and blanket them instantly, while you are rubbing their legs.' I think the groom is sound, and I've noticed the same practice myself in England."

Breeder and Grazier.

South-down Sheep.

We present to our readers to-day, illustrations of a pen of beautiful South-down wethers, and of a prize South-down ram. This old and favorite breed holds its own bravely, as a fine short-wooled sheep, and though not so popular on this side of the Atlantic as in England, as the Cotswolds, Leicesters and Lincolns. There are many fine flocks of Southdowns to be found in Canada and the United States. The following is Mr. Ellman's description of a good Southdown:—

"The head small and hornless, the face speckled or grey, and neither too long nor too short. The lips thin, and the space between the eyes and the nose narrow. The under jaw or chap, fine and thin, the ears tolerably wide and well covered with wool, and the forehead also, and the whole space between the ears well protected by it, as a defence against the fly. The eye full and bright, but not prominent. The orbits of the eye the eyes can or horn not too projecting that it may not form a fatal obstacle to lambs at birth. The neck of a medium length, thin towards the head, but enlarging towards the shoulders, where it should be broad and high, and straight in its course above and below. The breast should be wide, deep, and projecting forwards between the fore legs, indicating a good constitution and a disposition to thrive. Corresponding with this, the shoulders should be on a level with the back and not too wide above; they should bow outward from the top to the breast, indicating a springing rib beneath and having room for it

the breast to the foot; not bending inward at the knee, and standing far apart both before and behind; the hocks having a direction rather outward, and the twist or the meeting of the thighs behind being particularly full, the bones fine, yet having no appearance of weakness and of a speckled or dark color. The belly well detached with wool, and the wool coming down behind and below on the knee and to the hock, the wool short, close, curled and fine, and free from spiry projecting fibres."

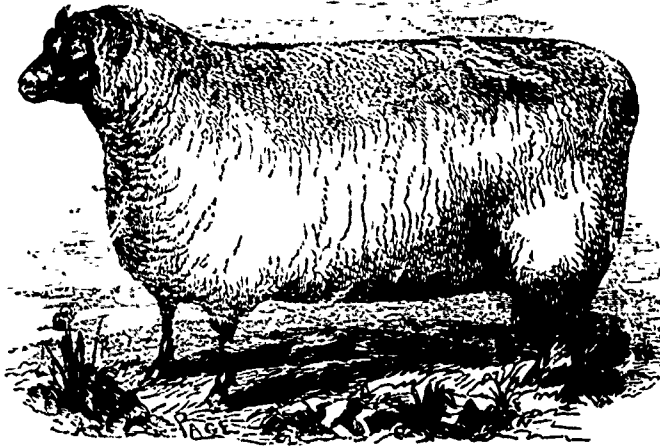
In England, the South-downs on the chalky soils of

adapted to the soil, climate, and markets of New England. It is a well-established fact that, for hardiness, sheep with gray or black faces and legs are superior to white-faced ones; and the wool of the Down sheep, whether we confine ourselves to the South-downs, or extend our examination to the varieties created from this stock, is of more general use than any other description, while the mutton stands confessedly higher than any other breed whatever."

Col. Thorne, the eminent agriculturist of New York, also gave the following testimony to their merits:—

"My flock of South-downs consists of something over two-hundred head, exclusive of lambs. They are descended from fourteen different importations, principally from the flock of the late Jonas Webb. Those not of his breeding were prize pens at the Show of the Royal Agricultural Society of England, and bred by Henry Luger, of Hemgrave, near Bury St. Edmunds. The rams used have all been selected with great care from the celebrated Abraham flock. With regard to the wool producing qualities of the South-down, the one year that I kept an accurate account, the ewe flock, including among the number sheep eight and nine years old, all having suckled lambs, gave 6lbs. 5½ ounces; the yearling ewes 8 lbs. 12 ounces; the yearling rams from 8 to 12 lbs. This was unwashed wool, though as you are aware their wool is not of a greasy character, and should not be shrunk at the most over one-fourth by the buyer. You may remember to have seen some notices of the sales

of Jonas Webb's Southdowns. The first sale, in 1861, included all the flock, except lambs, and numbered 200 rams and 770 ewes. They brought \$54,630. The balance were sold in 1862, and numbered 148 rams and 289 ewes. Amount of sale, \$25,600. Total two years' sales, more than \$80,000.



Sussex stand unrivalled, and it is claimed for them that they yield more meat in proportion to offal than other of the short-wooled varieties. In England, as in Canada, advantage has been gained; from a cross with Cotswolds, or Leicesters.



PREMIUM SOUTHDOWN WETHERS.

The ribs coming out horizontally from the spine and extending far backward, and the last rib projecting more than the others; the back flat from the shoulders to the setting on of the tail; the loin broad and flat; the rump long and broad, and the tail set on high and nearly on a level with the spine. The hips wide; the space between them and the last rib on either side as narrow as possible, and the ribs generally, presenting a circular form like a barrel. The belly as straight as the back. The legs neither too long nor too short. The fore legs straight from

In the United States, many of the most successful sheep-breeders hold the Cotswold in very high estimation. Mr. Tray of Massachusetts, a few years ago, spoke of them in the following terms:—

"The writer has no hesitation, after an experience of many years, and after having visited the various breeds upon their best localities, both in this country and in Europe, in recommending the Down sheep, including its sub-varieties, such as the Shropshire Downs and the Oxford Downs, as the breed best

In Canada, Mr. Stone, of Guelph; Mr. Irving, of Hamilton; Mr. Douglas, of North Dumfries; Mr. Ash, of Thorold; Mr. Yorke, of Wardville; Mr. Maboe, of Middleton; Mr. Forfar, of Agincourt; Mr. Rensselaer, of North Dumfries; Mr. Bethel, of Thorold; Mr. Jackson, of Caistor; Mr. Spencer, of Whithy; Mr. Anderson, of Guelph; Mr. Levi Wilson, of Trafalgar; Mr. Hurvel, of Trafalgar; and many others give great attention to the breeding of South-downs.

Treatment of Calves.

Most farmers do well to make calculations to raise one or more calves each year to keep up their herd, especially those beyond the limits of the milk supply of our great milk markets. It often costs more to raise than it does to buy, but then it is to be considered that they can generally raise better animals than they could buy at low the prices at which heifers generally rule. We know it costs considerable to raise up a heifer well to the age when it is proper to have her come in, but notwithstanding this fact, we are satisfied that it is often better to raise enough to keep up the herd.

The calf to select to raise ought to be from a well bred mother that is fully matured, not less than three or four years old and not over nine, a cow that is known to be a good milker. The bull or the father of the calf ought to be fine bred, not less than two years old and care ought to be taken that he comes from a good milking stock. It is desirable that it should be an early calf not later than March, and if as early as the first of March all the better. An early calf gets a better start in the spring than a late one, and if it is properly taken care of it will go through the summer stronger and come up in the fall larger and better developed and will be more likely to come in at two years old making a larger size cow than the late calf. We like to have the heifer that is designed for the dairy come in at two years old rather than three. We want her to form the habit of making milk early, while her system is plastic, easily influenced, so that by proper feeding, we can develop the mammary system to its utmost capacity. It makes a great difference in the actual value of a cow, whether her organs of secretion are brought into action young when they are forming and developing with the other organs of the body.

For the young calf there is nothing so good as new milk and for the first few days it is quite essential, but it is not very essential that it should be continued beyond two weeks of age, and where milk is worth from three to six cents a quart it soon gets to be too expensive to follow it up longer than is necessary. It is advisable to teach the calf to drink as soon as possible, say at two or three days old, and after suckling two or three days, if it is left without an accustomed meal it will generally take hold very readily. We never had much difficulty in teaching a calf to drink and we have acted the part of tutor for a good many juveniles of the bovine persuasion. But keep up the new milk from the cow, its own mother, if possible for a fortnight at least, and then it may be mixed half and half with skimmed milk, and if a little oatmeal is at hand a slight mixture of that will be useful. Never feed too much at a time but feed often, say three times a day at regular hours. Four quarts is enough at a time. At three or four weeks old the calf will begin to nibble a little at some early cut hay or rowen, when slices of roots may be offered and soon shorts or oatmeal may be added regularly to its drink. The oat is great at forming muscle growth, and does not cause the animal to run to fat; the tendency to run to fat for a calf destined for the dairy must be avoided. A good thrifty growth, making the animal straight and healthy, is vastly more important than fat.

Some farmers try to cheat their calves with hay tea, porridge and other slops and take off the milk too early. There is no economy in this, and if a farmer cannot afford some milk till the calf is old enough to live on more solid food, it is better not to try to raise it. We should say pure, new milk never less than a week, and not less than two weeks is better, and after that half new milk and half skimmed till the stomach is strong enough to digest solid food. Indeed those calves that have more or less milk till three or four months old, do better than those that are deprived of it young. If a calf gets its food regularly and is not allowed to go too long, so that its appetite becomes so ravenous as to make it take its food too rapidly, it will usually escape difficulties of the bowels, costiveness and looseness. And a little salt in the food as often at least as once a week, and that will help to keep the digestion regular and right. Scald the milk if looseness comes on and that will generally check it.

At four months the calf can shirk for itself, but it ought to have a good sweet pasture, and if the water is not plenty and pure, keep a trough of water where it is easy of access. The young animal is a tremendous drinker. It is desirable that the calf pasture should be near the house so that the little ones can often be seen and visited.

A heifer ought to be kept growing thriftily but not fattened, till she comes to milk, and if possible

she ought to drop her first calf just before going out to pasture in the spring, or say ten days or a fortnight before. There will be less danger of trouble with the udder at that season. And after she is well brought to milk, say a week or ten days after calving, she should be liberally fed on milk producing food, if she is not on grass. The first season of her experience as a milker will have a good deal to do with her usefulness and profit as a dairy cow. Milk her carefully and regularly, till the next calving time, and if she will hold out well quite up to this time, we think it better to encourage this tendency the first year. It will fix the habit of holding out well.—*Mass. Ploughman.*

Proposed Points for Jersey Cows.

- | | |
|--|-----|
| 1. Head small, bony, and rather long | 2 |
| 2. Face dished, broad between the eyes and narrow between the horns | 1 |
| 3. Muzzle small, encircled by a light color | 1 |
| 4. Nose black, with large nostrils | 2 |
| 5. Eyes full and placid | 2 |
| 6. Horns small, crumpled, and amber color | 6 |
| 7. Ears small and thin | 2 |
| 8. Neck slim, rather long, with clean throat and light at the shoulder | 4 |
| FOREPART 20. | |
| 9. Shoulders sloping and lean, withers thin, and breast broad | 3 |
| 10. Back level to the setting on of tail, and strong across the loin | 5 |
| 11. Body capacious, bony, hooped and deep at the flank | 10 |
| 12. Hips long, and of good width between | 2 |
| BODY, 20. | |
| 13. Udder capacious and running well forward | 5 |
| 14. Udder well up behind, broad and deep | 7 |
| 15. Udder free from hair and not fleshy | 3 |
| 16. Teats good shape, large and well apart | 6 |
| 17. Milk veins large and irregular | 10 |
| 18. Mirror high and broad, and full on thighs | 10 |
| UDDER, 40. | |
| 19. Thighs thin and wide apart, with legs standing square | 3 |
| 20. Legs short, small below the joints and flat | 3 |
| 21. Color of skin, udder and inside of ears yellow | 7 |
| 22. Hides mellow and thin, with soft, fine hair | 3 |
| 23. Tail slim and long, reaching to the hoof, with good brush | 2 |
| 24. Disposition quiet and good natured | 1 |
| 25. Size medium, color good | 1 |
| Perfection | 100 |

How to keep Hogs Healthy in Pens.

Our correspondents often mention the fact that their hogs, kept in pens are not healthy, seem often to lose their appetite, etc. Mr. G. F., near Bloomington, Ill., asks us: "What can be done to keep my hogs healthy, confined in pens. They have plenty of corn and water, and are kept clean; yet they often have a miserable appetite, and do not gain as fast as they should. They have sometimes appeared feverish, and on butchering last fall found livers not quite healthy. Can you give me any remedy?"

This brings up questions of great importance on pig feeding. The first mistake to be corrected, is the prevalent impression, that the pig can be healthy on concentrated food alone. Corn meal, or corn unground, is in too solid and compact a form as it reaches the stomach, the gastric juice cannot properly circulate through it, and perform its digestive function. The hog requires a certain proportion of coarse food to be given with the grain, in order to maintain it in health.

We experimented with six pigs of the same litter, fed three wholly upon corn meal, wet up in cold water, and the other three were fed upon corn meal mixed with double its bulk of green cut clover. At ten months old they were slaughtered, and those fed upon meal and clover dressed fifty per cent. more than the three fed upon meal alone. The symptoms of those fed upon meal alone were quite similar to those mentioned by G. F., while those fed upon meal and clover were always healthy, and ate, in addition to the clover, as much corn meal as the others. An experiment in winter with meal alone, and meal and clover hay cooked, resulted the same; and from these and various other trials, we became satisfied that much of the disease among pigs is occasioned by feeding wholly on concentrated food.

Variety of Food.

Farmers overlook the necessity for variety in the diet of their pigs. All our domestic animals require a great variety of food to supply all the wants of the system. We have no doubt but that this confinement to one kind of food for a long time is the frequent cause of disease in pigs. Green clover in summer, besides giving bulk and lightness to the

food, furnishes a larger proportion of muscle-forming matter, and phosphate of lime for the bones. In winter, when green clover cannot be had, the next best green food is beets, carrots, turnips, etc., and when these are not to be had, short cut clover or other hay boiled with meal, well answers the purpose and will be eaten greedily. Several different kinds of grain should be ground together to give variety, and this can usually be done by the farmer without inconvenience. We have an acquaintance in Wisconsin, who has found it profitable to feed large numbers of pigs and hogs, in winter, on barley and corn ground together, mixed with an equal quantity of short cut clover hay, all boiled together. Upon this diet their thrift has been remarkable and their health perfect.

Experiments of Lawes and Gilbert.

The great English experimenters have met with the same obstacles in feeding corn meal alone to hogs. Some thrived passably well, others became diseased, had large tumors and swellings about the neck and shoulders, with difficulty of breathing, etc. They made and administered the following compound: twenty pounds of finely sifted coal ashes, four pounds common salt, one pound super-phosphate of lime, all well mixed together and put into a trough where the hogs could eat it at will. They say of the result:

A trough containing this mineral mixture was put into the pen at the commencement of the second fortnight, and the pigs soon began to lick it with evident relish. From this time the swellings or tumors, as well as the difficulty in breathing, which probably arose from pressure of the former, began to diminish rapidly. The three pigs consumed of the mineral mixture described above, nine pounds during the first fortnight, six pounds during the second, and nine pounds during the third.

The improvement made in the health of the pigs was owing, first, to the antiseptic properties of the mixture, absorbing and neutralizing the gases in the stomach, caused by indigestion; and second the assimilation and digestion of small portions of the phosphate and sulphate of lime and chloride of soda, these making up for some of the deficiencies of the corn meal. But a ration of green clover, carrots, or beets with the meal, would have prevented the disease.

A better remedy than that of Lawes or Gilbert, would be finely ground raw bone and wood ashes, saturated with diluted carbolic acid. This mixture should be kept where the pigs can eat it at will. The pig, unless a breeder, will stand confinement remarkably well, if given the proper food.—*Buffalo Live Stock Journal.*

Pedigrees of Swine.

When Short-horn breeders so carefully avoid grades, why it is that grade hogs are so popular, or rather, have been so popular? The Poland-China, Chester White, etc., are breeds recently home-made and of origin from common stock crossed with the Suffolk or Berkshire, and are only grades. They may at any time breed to their common stock. In fact the growing unpopularity of these breeds arises from the fact that they are such uncertain breeders. Had we a Hog Herd-book on the basis of the Short-horn Herd-book such breeds as the Poland-China, etc., would not be entitled to admission. We should then be obliged to acknowledge that the only thorough-bred hogs in this country are the Suffolk and Berkshires.—*Victor in Western Rural.*

SAWDUST.—The *London Field* says of sawdust: I litter the horses on it to a depth of nine inches, raking off the damp and soiled surface every morning, and spreading evenly a little fresh, removing the whole four or five times a year. Its advantages appear to be many, of which I will state a few which give, in my estimation, its greatest superiority over straw. It is much cleaner, and more easily arranged; and, of course, much cheaper at first cost, making in the end excellent manure. It is peculiarly beneficial to the feet, affording them a cool, porous stuffing, a substitute for the soil of earth we always find in the hoofs of a horse at grass, and presents the nearest resemblance to the horse's natural footing—the earth. We never had a diseased foot since the introduction of sawdust in the stable now some years since. Horses bedded on sawdust are freer from dust and stains than when in ordinary litter, simply because sawdust is a better absorbent, perhaps, and testify their approval of it by frequently lying down for hours in the day. It has also the recommendation of being unsteady—an advantage which all in charge of horses with the habit of eating their litter will admit."

The Dairy.

EDITOR—I. B. ARNOLD, OF ITHACA, SECRETARY OF THE AMERICAN DAIRYMEN'S ASSOCIATION.

Food for the Dairy.—Continued.

If the herd has been properly cared for while grazing, the flow of milk will be considerable upon coming to the stable for winter quarters, and it is advisable to keep it up as well as possible. The idea conveyed by the phrases, "a cow is a cow," and "it costs as much to keep a poor cow as it does a good one" is now discarded by intelligent dairy-men. A good cow needs more food than a poor one, and the more milk she gives the more food she requires. But it will not pay the farmer, who is short of fodder, to dry up his cows early to save keeping. He will lose money in the end by doing so. A cow that is coming in the first of April may be milked till the first of February, if she is well kept. At the ordinary prices of keeping and of butter, she will make butter enough from the beginning of foddering to the first of February, to pay the whole cost of wintering, with the cost of all the extra feed counted in; and she will lose nothing in flesh or vigor by doing so. If the supply of food is insufficient, milking so late would be detrimental, as it would tend to debilitate the cow. It pays best to feed

Feed Well.

liberally and milk liberally. Hay alone, especially if it is cut after it is in blossom, will not be sufficient. When not in milk, a cow can get along well on good hay alone. But she cannot eat and digest enough to support herself and keep up a good yield of milk. Either her flesh or her milk will fail. Some feed rich in fat-forming material should be mixed with it. But if hay is cut early, before it is in bloom, and will cured it will do well alone. The difference between

Early Hay and Late Hay.

late and early cut hay is not generally appreciated. The later hay is cut the less is the per-centage of flesh-forming elements, the lighter colored its butter, and the more slowly does it digest. Grass cut a week before it is in blossom, and grass cut a week after it is out of blossom, are very different for feeding purposes. The later cut hay will contain about 40 lbs. in a hundred that will be made available for food, the fatty matter will be pale, and it will take six hours to digest a meal of it. The early cut hay, on the other hand, will contain about 55 lbs. in every 100 lbs. weight of available matter, which will be in better proportion and better color, and will digest in four hours as well as the other will in six. Horses and mules digest late cut hay very well, especially the mules; but if eaten in a dry state it is not well adapted to the bovine stomach, and they fail

Green Food most Nutritious.

to digest it thoroughly. This is proved by the fact that cattle will live and maintain themselves on a smaller amount of nutriment when given in green food, which is easy to digest, than they can if given in dry hay well matured. The following extract from the address of Dr James Law, of Cornell University, delivered before the American Dairymen's Association in January 1870, is in point:—

"A bullock may be kept in fair condition on 120 lbs. of turnips daily, but could not be so supported on 8 or 9 lbs of Timothy hay, though, as judged by their relative amounts of proximate principles, their nutritive value should be nearly the same. Again, cattle which are fed in Scotland on turnips and uncut wheat or oat straw, occasionally make as much as 2 lbs. increase of weight daily, on a diet of 180 lbs. Swedish turnips and 5 lbs. straw per day, yet no one would expect this daily increase on a diet of 20 lbs. of hay per diem, which would be a fair nutritive equivalent, as judged by its chemical constituents, and, moreover, is greatly superior to it in those fat-producing principles which are especially required in the feeding ox. The difference in result is unquestionably due to the abundance of water in the tur-

nips in intimate union with their nutritive constituents, and which renders them more easily assimilated. The plentiful supply of liquid to the blood and tissues not only favors the destructive and reparatory changes in those, but maintains in full activity the various secreting organs, counteracting costiveness, suppressed, concentrated and irritating urine, inspissated bile, and the like. The same result follows in all cases when this finely divided and watery food is supplied; and however the condition may have been brought about, whether by cooking, macerating, germinating, or otherwise, other things being equal, the progress made in growth, in fattening, or in the yield of milk, testifies to the enhanced value of milk in this particular condition.

Dairymen in the States, especially in the older dairy districts, are every year cutting their food for winter a little earlier. In central New York, hay is cut 20 days earlier than it was twenty years ago.

Coarse Fodder.

But the reader is probably ready to ask, if it is advisable to milk cows up to within 8 or 10 weeks of calving in again, and common hay is not good enough to keep them on without extra feed in some form, what is to be done with the coarse fodder, corn-stalks, straw, &c.? Must it be thrown away? All the fodder that is grown on the farm can be profitably fed to the dairy if properly used. Before speaking of its use, however, a word in regard to the nature and purposes of food may not be amiss.

Composition of Cattle Food.

The food of animals is not one homogeneous mass or single composition. It is composed of several distinct parts, each of which performs a distinct part of the economy of life, and cannot be substituted for any other. One kind of food, having a definite composition, builds up flesh and restores its waste, and exists in several different forms and is known under different names, as albumen, fibrin, casein, gluten, &c. They are all included under, and are designated by the terms, albuminoids, or flesh-forming food. Another kind supplies the material from which are generated animal heat and force. This kind of food is made up of fats and oils, starch, gum, sugar, &c., and are called supporters of respiration, or heat-producing food. Besides these, water and certain minerals as soda, lime, phosphorus, iron, &c. enter into the composition of the bodies of animals, the latter chiefly to build up the bones. As the minerals, excepting salt, are usually in sufficient supply in all kinds of food they need not be considered here. What we wish to call the attention of the reader to, is the fact that the albuminoids and heat-producing foods must sustain certain relations to each other, and be supplied in certain relative proportions according to the condition and circumstances of the animals. If a cow is not in milk she may not need any more albuminoids in cold than in warm weather; but she would need more heat-producing food to keep her warm. In the summer for every pound of flesh-forming food she uses, she will require three pounds of heat-producing food, and in the winter 5 or 6 lbs.; a cow can live well on food in such proportions if she is doing nothing but living. Twenty-five pounds of hay per day would give her 2 lbs. of flesh-forming and 10 or 11 for producing heat, and this would supply her necessities. But it would not support her and a flow of milk too, in which albuminoids are in much greater proportion (2 to 5). Hence the necessity of some other food to go with it to furnish the albuminoids for the milk. A few pounds of meal, or bran, or early cut hay, or oil-cake (in all of which albuminoids largely exist), will supply just what was needed.

Corn-Stalks and Straw.

In a similar way we can use the corn-stalks and straw. In corn-stalks for example, albuminoids and supports of respiration are as 1 to 13, the former being deficient; in pea and bean meal, in which are about 25 lbs. of the former, to 50 lbs. of the latter in a hundred-weight; we have the means of balancing the elements of food so that the excess of starch and sugar in one, and of flesh-forming elements in the other, shall be economized to the best advantage, nothing being lost. Straw may be made use of in the same way. The respirative elements of food in it are in the relation of about 1 to 15, supposing the grain to be ripe when the straw is cut. Different kinds of straw of course vary in value; and the value of each will vary with the time of cutting. If the grain is in the dough stage when cut, the relation of the two kinds of food will be about as 1 to 10. Coarse fodder generally abounds in heat-producing food, and is deficient in flesh-forming matter; and it is therefore heat fed when the cows are not in milk. With 15 lbs. of straw or stalks cut and wet, a few

pounds of bran or meal (say 4 lbs. of bran and 1 lb. of pea meal) mixed with it, will keep a common sized native cow in good condition, if she has the benefit of a comfortable stable. Larger cows, and those that are exposed to the cold, will require more. With a little more ground feed added, this same diet may be given to cows in milk. All the coarse fodder a dairyman has occasion to raise may thus be used in wintering his stock, and at a less cost, the fodder and grain being counted together, than he can winter them on hay.

Feeding Values.

We copy from the table of Wolff & Knop, as quoted by S. W. Johnson, the nutritive and heat-producing values of some of the different kinds of winter food in common use. It may be of some advantage in adapting the different values to each other. They are arranged in the order of their flesh-forming material:—

	Albu- minoids.	Starch, Sugar, Gum, &c.	Fat.
Oil Cake	28.3	41.3	10.0
Bean Meal	25.5	45.5	2.0
Pea "	22.4	52.3	2.5
Alsike Clover in blossom	15.3	29.2	3.3
White "	14.9	34.3	3.5
Rye Bean	14.5	55.5	3.5
Lucerne in blossom.....	14.4	25.5	2.5
Wheat Bran	14.0	50.0	3.8
Red Clover in blossom...	13.4	29.9	3.2
Oats.....	12.0	60.9	6.0
Orchard Grass.....	11.6	40.7	2.7
Rye Meal.....	11.0	69.2	2.0
Meadow Fox Tail	10.6	39.5	2.5
Corn Meal	10.0	68.0	7.0
Timothy Hay	9.7	48.8	3.0
Barley	9.5	66.6	2.5
Buckwheat	9.0	59.6	2.5
Common Hay	8.2	41.3	2.0
Pea Straw	6.5	35.2	2.0
Corn Stalks	3.0	39.0	1.1
Barley Straw	3.0	32.7	1.4
Oat "	2.5	38.2	2.0
Wheat "	2.0	30.2	1.5
Potatoes	2.0	21.0	0.3
Ruta Bagas	1.6	9.3	0.1
Carrots	1.5	10.8	0.2
Turnips	1.1	5.1	0.1
Beets (Sugar).....	0.8	15.4	0.1

As a part of the heat-producing food must be fat, it has been placed in a separate column.

There are so many circumstances that vary the quantity of food required for the daily use of a cow, that no precise figures can be set down as representing the exact amount of the different elements necessary for her to subsist upon, but the following may be regarded as approximately correct for an average sized cow of the common breed when not in milk. Her daily food should contain at least, albuminoids 1 1/2 lbs.; starch, sugar, &c., 8 to 10 lbs.; fat 15 lbs. With a large flow of milk the albuminoids would need to be doubled; the starch, &c., increased one-half, and the fat doubled. From this it may be seen how to proportion the several kinds of food to adapt them to each other, so as to use them with economy. If the food is to be used dry, an allowance of one-fourth should be made for imperfect digestion. If cooked or steamed the digestion will be perfect and the whole amount may be

Comfortable Stables.

counted. This amount will be required for cattle provided with warm and comfortable stables and kindly cared for. If they have no other protection than an open yard or shed, one-half more should be added to the quantity named. This may seem a large allowance, but experiments made at the barn of the writer, and tested by actual weights, have demonstrated this difference between comfort and exposure, and the experience of hundreds of others have corroborated it.

In the early settlement of the western world, barns were built everywhere by siding up a frame with boards not fully seasoned, which shrank in course of time, leaving cracks between them half an inch or more wide. It was customary to arrange stables for the cows on one side of the barn, with their heads pointing toward the floor in the centre, the side next the floor not being boarded except at the bottom, to make a manger. The air streaming through the cracks in the side of the barn, carried the air warmed by the heat radiating from the bodies of the cattle, past their heads into the middle of the barn, and rising up, it went out through the cracks above. The cows were kept in a current of cold air but little different from being out of doors. As these primitive barns have been replaced by new ones with sides boarded with matched stuff, and with the exception of means for ventilation, the stables tightly boarded all round,

as to save all the warmth given off from the animals, it has been the uniform testimony of each farmer, as he placed his cows in his new and warm stables, that he required but two-thirds of the hay to keep his cows that he did before. Among the numerous farmers who have heard speak of their experience with such barns, there never has been any less estimate of the saving of food effected. I commend their experience to the consideration of the reader, and submit whether the first item in the economy of winter food for the dairy, is not the comfortable housing of the herd?

Early Spring Feeding.

Supposing the cows to have been so well provided for as to have arrived near the milking season with flesh and strength unabated, preparation for spring may be entered upon by a moderate increase of feed, two or three weeks before the cows are expected to "come in." This is necessary to increase their vigor to sustain them in the severity of approaching labor, and supply the rapid growth of the fetus. Some kind of grain should be used for this purpose. Corn is often used, but any other of the cereals is better. Corn is a little too heating for this period. Some food richer in albuminoids should be used, a mixture of different kinds of grain in which oats form a prominent item, has proved very satisfactory in our experience. But nothing that we have ever fed at this critical season of the year has ever proved so efficient in good results as green and succulent food, beets, turnips, potatoes, carrots, apples, cabbage, ruta bagas, &c., all of which have seemed to serve the same purpose. They improve the general health of the animal; they are easily digested and assimilated; they increase the volume of the blood, making it thinner, and its circulation into the minute vessels more complete and even, and thereby aid most effectually in the relaxation of tissues and expansion of parts so necessary at this particular time. Where roots have been given two or three weeks in advance, labor has been easier and sooner recovered from, and the flow of milk has been larger than when they have not been used. Whether it will pay to raise roots to feed through the entire winter as a substitute for hay, may be a question, but that they contribute to the general health of the animals at any time when fed in reasonable quantities, is not doubted. Though good at any time, they have a special utility in the spring. They not only prepare the cow for an easier labor, but they prepare the whole system for an easy and gradual change from foddering to grazing, so that no shock is felt. They cleanse the blood, and put the milk-glands not only, but the entire glandular system, in perfect working order, and thus extend their influence through the whole summer. When cows come in during the foddering season, there is nothing that will so well prepare them for a bountiful return during the whole remaining period of lactation, as a moderate use of green food while the foddering lasts. For feeding at such a time, it pays its cost many times over, let the question of profit at other times be answered as it may.

In the early part of the season the active state of the milk-glands will enable a cow to carry off in her milk all the nutriment she can digest above what she can assimilate. If there is any profit in milking at this season, it is in making her digest all she can. To this end she should not only be supplied with all she can eat of food rich in the elements of milk, but her dry food should be selected from such materials as will digest most easily and rapidly. The propriety of providing early cut hay for feeding at this time, will suggest itself, as its easy digestion and its richer and better nutrition, have already been explained, and need not be dwelt upon now. Of course no skilful feeder will select late cut hay, or ripe stalks, or straw for cows in milk in the spring. But sometimes necessity compels their use. Though not the most profitable food, they may serve a valuable purpose to carry a herd along to grass; and if skilfully compounded with meal, will give fair results. For directions for feeding meal with coarse fodder the reader is referred to an article entitled "Mixed food for the dairy" in THE CANADA FARMER of January 30th, 1873.

We have now followed the food of the dairy through the year; and cautioning the dairyman to omit heavy feeding for milk for ten days or so after his cows have come in, and reminding him how much his pocket—if not his better nature—will be improved by kind care and watchful attention to the comfort of his stock, we leave the subject for the present.

Milk Dairies near Cities.

Near the older cities of the United States are extensive and costly buildings and appliances, for the saving and cooling of milk. In the establishments supplying the city of Chicago, but little machinery is used. The milk is procured from numerous stations lying along the railroads radiating from the city, the largest amount being brought over the lines controlled by the north-western railway. The number of cans contributed from each station within a radius of fifty miles varies according to the number engaged in the business.

In the summer, the milk is cooled by placing the cans, either in cool running water, or that from a pump or open well, in such a manner as to give the water free access to all sides. About half an hour is required to sufficiently cool the milk after which the cans are covered with blankets to prevent them from again being heated. In the late fall, the winter and early spring, of course this is not necessary. Some farmers have a vat for cooling, sufficiently large to more than hold the supply, where it may be stirred while cooling, but this practice does not meet with approbation. That these dairymen find the business profitable there is no doubt, since each cent per quart received for the milk is equal to about fourteen cents per pound for butter; fourteen quarts of milk being the average for one pound of butter during the year. This again, however, will vary, some particular cows giving milk, ten quarts of which will make a pound of butter, while others will take sixteen. The average quantity of milk per cow in dairies is said to be 1,900 quarts per year. This would give an average of over ten quarts per cow for six months in the year. 1,900 quarts of milk at two and a half cents per quart is \$47.50. The deacon calf is worth from one to two dollars if sold. 1,900 quarts of milk at the average should produce 135 pounds of butter, which to realize two and a half cents per quart of milk must be sold for over thirty-five cents per pound, fully ten cents more than the average price of the best dairy packed article in Chicago. Again 1,900 quarts of milk at the average of ten pounds or five quarts of milk to one of cheese will produce 380 pounds, which at fourteen cents per pound is \$53.20, showing a difference in favor of cheese of \$5.70 per cow, a margin sufficient to pay for the erection of buildings and machinery.

There is no difficulty in selling really first-class butter made under the factory system to special customers at thirty-five cents, or even forty cents per pound, if the quality is certainly guaranteed to be uniform, and of the highest grade; and the difference between the value of the buttermilk and whey ought to make the difference between the money value of the butter and cheese. It will be seen, therefore, that the manufacture of cheese and butter are among the most important of those connected with agriculture, and that these manufactures in districts far distant from our great cities may be made fully as profitable as selling milk direct is near the cities. — *Western Rural.*

When Should Cows Come In?

At a meeting of a Farmers Club, at Evans, upon the question, when should cows come in to give most milk in a year? a correspondent of the *Live Stock Journal*, of New York reports that most of the members answered, middle or last of April, or just before grass comes into full bite.

Mr. Clark thought if the cow came in in winter, and was fed well till grass came, she would give more pounds of milk during the year than if she came in on grass; but in discussing the question of profit, the extra amount of feed required for winter would have to be taken into account.

Mr. Stewart said his experience upon this question had surprised him. He had supposed that a cow coming in on grass and being well fed for the usual period of milking, would give more milk than if she came in during the cold season. Had tested it on several cows, and in every instance the same cow gave more when she came in during January than in April or May. Is milking a cow now that came in, January 19, 1871, and gave 6,287 pounds in 310 days. She came in last April 27th, has given in 258 days 4,271 pounds of milk, and is giving now eleven pounds per day; but if she could give eight pounds average for forty-two days more, she will still fall 1,671 pounds short of her production when she came in in January, and she has been fed higher during this than the previous season. This cow has in two previous instances shown as a great difference in favor of coming in during winter; and with four other cows he has found the same rule to hold. From his experience he believes more butter can be made from the same cows when they come in in fall or winter than in April or May. But they must be

well fed during milking time in winter, and then, on grass in summer, they will fall but little below those that came in in spring.

Mr. Irish had a cow that came in in November, 1871, and had given milk ever since. She made a pound of butter per day the first winter, and she is now milked with another cow that came in early last March; together they give thirty-four pounds per day, and make ten and one-half pounds of butter per week. They are both coming in again the latter part of March next. He has found it profitable to feed cows for milk in winter.

When to Dry-off Cows.

Mr. Harris Lewis, writing to the *New York Times* upon the subject of winter feed and care of cows, has the following sensible and true remarks:—"Cows in good condition, and those inclined to become fat during winter, may be milked up to within six weeks of calving time to good advantage. In most cases, milk cows which become very fat at any time after first coming in milk, will, as a rule, ever after be more inclined to lay on fat than to produce a large quantity of milk. Hence an inclination in the cow to put on fat may be regarded as an unfavorable indication, so far as her usefulness as a milker is concerned, and should be guarded against by keeping her in milk to a later period of gestation. But cows which go into winter quarters in low condition as to flesh should be dried off sooner, allowing them more time to recuperate their wasted energies. This will be less expensive than a shorter time of rest and high feeding, and much better for the cow and her offspring.

"Gentleness in the care and management of dairy cows is so essential to success, that it cannot be too highly commended, or carefully practiced. That man who is very passionate, not only passionate but ugly, not only passionate and ugly, but brutal, should never engage in the dairy business; should never become the owner of any living thing which would be subject to his control or dependent on his care. There is no law more firmly fixed and unalterable than that like produces like in our conduct toward, and treatment of, the lower as well as the higher orders of created beings. As certain as the day follows the night, kindness to the brute begets kindness in return; affection begets affection; hate begets hate, and brutality begets brutality in return. The cow is naturally a quiet, confiding animal, and becomes most profitable to that owner who carefully studies her nature and habits; who anticipates her natural wants, and gratifies all her legitimate desires."

Adulteration of Milk.

Under the Adulteration Act in Birmingham, England, several milk dealers have recently been prosecuted and fined the mitigated penalty of 20s. and costs for selling milk diluted with water. In defence of the milkmen it was urged that the article was sold without fraudulent intent, that only 20 per cent, which appears to be the usual trade dilution, was added, and that 1½d. per pint only was charged for the innocent mixture, whilst pure milk undoctored sold at 2d. or even more. But the magistrates very properly insisted that the public must be protected from imposition, and if dealers desired to dispose of milk and water with impunity they must inform their customers of the mixed nature of the article vended. Were this plan carried out to the letter the usual milk dealers sign in many shops in Birmingham and elsewhere would have to be thus amended, "Milk and water sold here."

The Cow's Teat.

In Europe, as milking is mostly done by women and girls, who have small hands, the size of the cow's teat is not so important as in America, where the milking is mostly done by men with large hands. This is a point which should be particularly attended to hereafter by breeders of dairy stock. No bull should be used by them which is not dropped by a cow with good sized teats, placed square on the bag, several inches apart, and slightly pointing outward. Of course the dairy qualities of the dam of this bull should also be extra good. Ayrshire, Devon and Jersey cows of the present day do not, as a general rule, have as long and large teats as they did twenty years ago, according to my best recollection; and the bodies of the latter, more particularly, strike me, also, as a general rule, as being of diminished size, compared to those we used to see imported by the late Messrs. Tainter and Norton, of Connecticut. The blood of these old importations is highly appreciated by the best breeders of the present day, and their descendants command high prices. These cows gave very rich milk, churning extra large quantities of butter.—A. B. ALLEN, in *Live Stock Journal*.

Poultry Yard.

Poultry Judging.

No class of animals at our agricultural exhibitions, require a more complete practical acquaintance with the numerous points indispensable in a first-class specimen, than do poultry. The breeds of fowls are not only many, but the distinctive points on each breed are very numerous, with all of which a competent judge should have a thorough knowledge. The combination of qualities therefore required to make up a good judge is very rare. There are few men who know many breeds well, and the difficulty of passing from one breed to another without the eye becoming biased is very great. A good judge must therefore be not of doubtful integrity and have at least a competent knowledge of all breeds of poultry, both in their merits and in their ordinary defects from a show standard. He must be cool, and yet quick of eye; patient and deliberate, and yet decisive, and able to make up his mind; have an opinion of his own and yet not be crochety or fanciful. He too, ought to be able to consider the circumstances of the day, a point little thought of by most exhibitors, who seem to expect that decisions should be always alike, that is, it may be necessary to judge differently at different times, and according to different faults prevalent at the time. For instance, supposing the case of a cochin slightly vulture-hocked, but of marked merit otherwise. The proper standard of perfection no one doubts, but if nearly bare legs were almost universal through too great fear of the hook, such a bird as we suppose might with advantage have first prize, supposing him better than the rest in other respects, whereas if vulture-hocks were becoming commonly shown, it might be equally desirable to pass him over, or only give a third or fourth place in order to discourage the popular fault. Some judges never go to an exhibition unless first furnished with the "Standard of Excellence" in their pocket, and instances might be mentioned where such a course is desirable, but the fault of all book-judging is that it is not elastic enough, and can make no allowances either for such things as we have just alluded to or many others; in fact the eye of a thoroughly experienced judge is worth all the "standards" in the world. The course lately adopted by poultry judges at some of the United States shows of "adding up all the points" of the various pens, and then awarding prizes in proportion to the number of points, is by no means the most perfect plan, besides which some of the decisions would after all be evidently wrong, after they are made for birds which would be clearly first, according to the "standard," would by no means be the best in their class. The points may put them first, yet no competent judge would like them. Better scales of these may certainly be arranged, but it is at least a matter of doubt whether an infallible "standard"—which shall correctly deal with every case—can be devised; so subtle and intangible are some of the features which at once work off a first-class bird from all its competitors, and which can be "felt" or seen much easier than they can be put upon paper. Nevertheless, a correct "Standard of Excellence" may be of the highest use. It may on occasions help even the veteran judge, it may be of much incalculable assistance to the inexperienced, and by study and patience train a good judge, it may maintain the fixed canons of a breed, and show the amateur what he has to aim at, it can tell him exactly the real quality of his birds, and almost exactly his fair chance of winning, and it can at least prevent the amateur public from being misled into breeding wrong through any glaring error in judging. Unquestionably, however, the eye and judgment of the best judges will and must continue to be the final authority at poultry shows; using "standards" as the name implies, chiefly as permanent canons to

which, if correct, it may be expected that awards will in the main conform, and especially not expecting that a book, however perfect, can enable anybody to judge fowls, as seems by some to have been expected.

The system pursued at our exhibitions of placing a trio in each pen has long since been discarded in England as unjust alike to the exhibitor and the judge. A pen of birds should consist only of a single bird or pair, (cock and hen). Nor should more than two judges be appointed to one class. With two judges, by far the best plan is for one to begin at the beginning of the class, and the other at the end, marking their books as they go through the class, and then compare the books, which will (if both are experienced judges) be often marked so much alike as to settle the prizes without further examination of the birds. When time is short, the quickest way of judging is in a preliminary walk through the class to mark off the pens possessing no particular claims to notice, and then more deliberately to consider the rest, or to attach marks to the more deserving pens, deciding their rank by degrees. In doubtful cases the scales may help to decide, but as a rule the less of these arbiters the better, though a good pair should always be at the service of the judges.

In England the idea is fast gaining ground that the best plan is to employ only single judges in each class, each judge being responsible for his own awards. A judge can always call in his colleague to advise in any case of difficulty; but by putting the real responsibility for every award on some one person's shoulders, the greatest likelihood, it is maintained, is secured of attaining all that character and ability can give to the task. If each judge would check over the awards of his colleague, remarking on any which to him appear erroneous, there will be little risk of any escaping detection. Open judging is a grave and serious blunder. In every case where it is possible to carry out the plan, no person beyond a careful man accustomed to handle poultry should be admitted to the show from the time the birds are all penned until the awards are fully completed. This one attendant, (or one to each set of judges), should be a man well practised in taking birds in and out of the show pens; and should the judges require his assistance to ascertain beyond question, by handling, any dubious points that may arise, he should always be ready to take out any fowl selected for special examination, and then withdraw beyond earshot, during the time occupied in final consideration. Judging at best is a thankless task. If all his awards are correct the judge has only done his duty, and if not he often reaps abuse in no measured terms. The least then that gentlemen who act in this capacity have a right to expect is that time and quiet be given them to perform their task with due deliberation and care.

Heat and Light—Their effect on Fowls.

Very diverse opinions prevail as to the best method of housing poultry in the winter, some entertain the idea that it is best to shut them in from light and cold, and very recently we were told by a fancier that he purposed constructing a house for his poultry having that object in view. Others think that poultry should be allowed to roost wherever they may find it convenient, either in barn, shed, or stable, and not unfrequently have we known birds being kept shut up during the entire winter months in an underground basement into which the sun's light never penetrated. We are of a different opinion. The house in which poultry should be lodged ought to be so constructed as to keep out not only frost and cold in the winter season, but also freely admit the heat and rays of the sun. The direct beneficial effects of the solar and luminous rays on animal and vegetable life are well understood and requires from us no lengthened demonstration. It is enough for us to com-

pare those who pass the greater portion of their lives in the open air, and in the sunshine, with those who are secluded from it, either by business occupation or obscure dwellings, to notice its effect on health and life. It has been proved that the quantity of carbonic acid exhaled by an animal increases with the intensity of light, and attains its lowest limit in complete obscurity, and as all animals, in the act of respiration, consume oxygen, and exhale carbonic acid, it will at once be admitted how necessary it is that a large supply of the former should be secured, especially so for poultry when kept confined, as will presently be seen. It is to the effect of the sun's rays we are indebted for the oxygen we consume, and unless the supply is equal to the demand the noxious effect soon becomes visible as well in men as in animals. But as respiration in fowls is effected more completely, extensively, and actively, than in any other class of similarly constituted animals, their average temperature is higher, and necessarily the exhalation of carbonic acid is proportionately greater. This extensive development of the respiratory process is due to the fact that air is admitted in fowls not only to the lungs but also to the interior of a greater or less number of the bones, and to a series of air receptacles which are scattered through various parts of the body.

The abdominal cavities are subdivided by means of membranous partitions into a series of cavities or sacs, which are termed the "air receptacles." These air-sacs are filled with air from the lungs, and vary considerably. They do not only serve greatly to reduce the specific gravity of the body, but also assist largely in the aëration of the blood. Connected with air-receptacles, and supplementing their actions in both these respects, is a series of cavities occupying the interior of a greater or less number of the bones, and also containing air. It will be seen then that the quantity of oxygen consumed by fowls is greatly in excess of that of any other class of the vertebrata; and in the sufficient and continuous supply of which, in a great measure, their health and profit depends. In young birds, however, these air cavities in the bones do not exist, the bones being simply filled with marrow, and to this fact may be attributed the small amount of injury sustained in over-crowding in houses, as compared with older fowls.

Poultry houses, then, should be so constructed as to freely admit the calorific rays of the sun, which are as essential to the health and recuperative powers of fowls as the food they eat is to the sustenance of their bodies—they constitute the incessant and periodically renewed source of power and life, not alone in fowls but in all other animal life; and the study and application of nature's fundamental laws are as essential to the rearing and keeping of poultry, as mating and crossing is to the production of pure breeds. Not until they are properly understood and acted upon and their beneficial effects utilized will the complaints of the unproductiveness of poultry become less general, the sooner, therefore, we apply ourselves to the task the better.

Fowls Taking Cold.

A great proportion of the ills to which fowls are subject arise from taking cold; during moulting season they are most sensitive to the changes of the atmosphere. *Land and Water* has the following timely suggestions in relation to the inducing causes, and the remedies:

The earlier symptoms are slight loss of appetite, drooping of the tail, and a clear limpid discharge from the nostrils. It is entirely due to exposure to damp and cold winds, and imperfect housing; but there are inducing causes frequently combined; improper and insufficient food is one which materially aids it by rendering the system poor and weak and incapable of resisting of shaking off any kind of hardship, however light. Breeding in and in, that is from stock related

to each other, is another means by which artificially reared families are certain to become weak and the seed of various diseases quickly sown, and the constitution degenerated with an inevitable certainty. Seeing, therefore, the means by which the stock is to be prepared for resisting the simplest disorders, should an attack come upon them in the form of a cold, take a few precautions for removing the cause, if it can be found by extra dryness of the soil upon which they rest, and taking special care they are not in the vicinity of stagnant moisture. There are few cases of simple catarrh that will not speedily yield to a little more generous feeding than that they have been used to. Crumbs of bread soaked in spiced ale are wonderfully efficacious, and should be given in addition to other meals if they will partake of so much. If the birds have not been carefully looked after in the first stage of the complaint it invariably runs into a worse condition. From the clear discharges from the nostrils as before mentioned, it here takes the most offensive forms; becomes thick and clotted, stopping up the nostrils; and the cavities of the air passages, being highly inflamed, continue to secrete the discharge. The eyes also become inflamed, and the frothy secretion exudes from the eyelids. The face and eyelids at once become swollen and the bird cannot see to feed. Here we have a troublesome case, and if the bird is valuable it should be removed at once to warm indoor quarters. We do not hesitate to say that there is no more contagious disease known to the feathered tribe; and any bird so attacked should be immediately removed from the rest. There is no doubt the disease is communicable in various ways, such as drinking out of the same water vessel, the liquid being contaminated by the discharge. In the same way the food they peck over, or the grass in their runs holds upon it some of the matter coughed or sneezed up. It is only with birds of value that real attempts at cure should be made, which should be to purge out with a dose of castor oil first. Bathe the head and nostrils with a warm, weak solution of carbolic acid; keep it from the bird's eyes. When the matter is free from the nostrils, slightly syringe (with a small ear syringe) some of the solution up the same. Well dry the feathers about the head and neck. Pills of the following parts should be always at hand, and one, night and morning, administered while the birds are ill: Quarter of an ounce of camphor, quarter of an ounce of valerian, quarter of an ounce of cayenne pepper, quarter of an ounce of lobelia seed powder, quarter of an ounce of gum myrrh; make into forty-eight pills.

Fattening Fowls.

The old plan of fattening fowls was to put from eight to a dozen in a coop with an open front, feeding them regularly three times a day. By employing a railed or barred floor, so that all the dung can fall through. Very good results may be obtained in this way, though either of the processes of cramming are now considered quicker and more economical, as compared with what we may call the natural plan. The coop must be arranged so as to be perfectly dry and free from draught, and should have a canvas cover to draw down and keep the inmates in darkness. Only fowls which have run together must be penned up in one coop, or their disagreements will prevent any increase of weight. Before commencing, the coop should be white-washed and the bottom bars cleaned, to prevent annoyance from vermin; and when put in, the chickens should be left for several hours without any food at all. This is essential and the neglect of it is why many amateurs in their first attempts in fattening their surplus, completely fail; as the birds being naturally fretful at their confinement refuse to eat heartily, and rather pine away; whereas by well fasting them before any food is given, they begin to feed at once. The quantity must be measured by the appetite, and none on any account left, but clean fresh food given as much as can be eaten without leaving, and water being supplied at the same time. When the feeding is done the canvas covering should be drawn down and the birds left in darkness till an hour before the next meal. The times of feeding must be observed with the greatest punctuality, or the fowls will fret and lose condition. The best food will be a mixture of barley-meal and oat-meal, or buckwheat meal with the husk sifted out, and mixed with milk. A little suet or lard added is recommended by some good authorities, and increases the fattening, but only to the advantage of the basting ladle. The process will be completed in from fifteen to twenty days, and should be carefully watched, as when the proper point is once reached, the chickens if not immediately killed, rapidly decline away.

Designs for Chicken Coops.

If there is a weak point in the culture of poultry, taking the country through, it may be said it is in chicken raising. Various diseases, inclement weather, rats, weasels, hawks, owls, and even crows, to say nothing of such vexatious and insidious enemies as various species of internal and external parasites, combine to make young chickens very uncertain property under the slipshod, unmethodical management that prevails on too many farms. In the first place, success depends very much upon the kind of coop used. In contriving coops, not all the foes liable to beset the hatching hen during incubation, but also the chickens during chickenhood, must be anticipated. Under favorable circumstances any old box, or crate, or barrel turned on one side, will do, or the hen may be left to wander with her brood, but this is by no means a satisfactory way. The following sketch of a hatching box will be found convenient, its simplicity being its chief recommendation:

Get a large tea chest, A, cut a hole round or square in the front of it, and nail two pieces of wood with a groove, or easier still, nail two pieces, the one over the other, but the edge of one projecting one-fourth of an inch over the other, and nail them on, on each side of the hole, they will form a groove for the door to slide

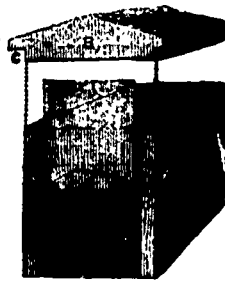


Fig. 1. Hatching Box.

in. To form the roof, cut two pieces of inch board in the form B, just to fit inside the chest, going in about one inch at C, and forming a projection or eave; nail some thin boards across these pieces, the edge overlapping, or it may be boarded straight, if afterwards a piece of felt be nailed on the boards to keep out the wet. This roof lifts off under so that a hen and eggs may be examined at any time, and the space between the boards and edge of the chest when the roof is on admits air. To construct the cage D, get some laths and nail them together as shown in figure 2, and the apparatus is complete, see figure 3.



Fig. 2. Cage D.

Any old box, any old pieces of chests, a few laths (sawn ones the best), a few nails, hammer and saw, and the coop may be constructed by a non-professional. The hen is put on the eggs, and is generally shut in at night by letting down the sliding door. Place food and water in the outer cage in the morning, and she will take care of herself and cannot get out, will return to her eggs, and cannot be molested by other hens. When the chickens are hatched they may be left with the hen in the same coop, and will stick to it when she is again in the poultry house if allowed. During the time the chickens are with the hen the box ought to be shifted every day or so, to give the hen the benefit of fresh ground, this may be done at night after the birds have gone to roost and no trouble is entailed. For people in bush settlements, there is no better, quicker, or cheaper plan of accommodation for a hatching hen and chicken coop than the foregoing, but if a more elaborate contrivance is required by people in towns and cities we suggest the following:

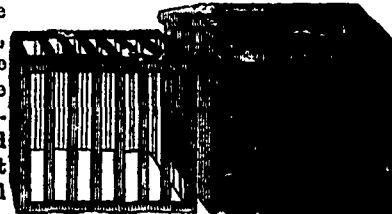


Fig. 3. Hatching Box Complete.

Figures 4 and 5 represent a very simple affair, designed merely to restrain the hen and protect at

least partially from rain. For the sake of warmth, the further side in the illustration is boarded and a board hinged at the edge and opened as in figure 4 to admit the sun in day time, and may be closed as in figure 5 to keep

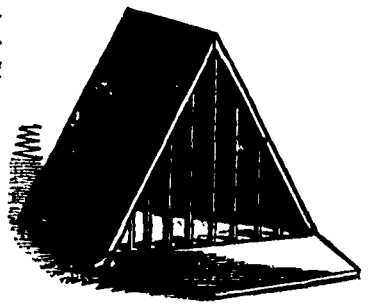


Fig. 4.

the cold out at night, but such coops will not answer either for extremes of heat and cold, driving rains, or for what is worse than all the rest, rats. Rats will climb up and enter at the top of the coop if there is an opening sufficient, or what suits them equally well, will burrow underneath if there is no floor. In figure 6 is represented a section of a coop with a moveable floor, arranged so that in wet weather the rain which falls on the roof will not

touch the floor. Figure 7 is an elevation of the same coop. Of course a board must be propped against the coop under the eaves next the slatted part if there is a driving rain from that quarter, and rats must be kept out in the same way. The benefit of this coop is that having a tight bottom, rats cannot get in under-

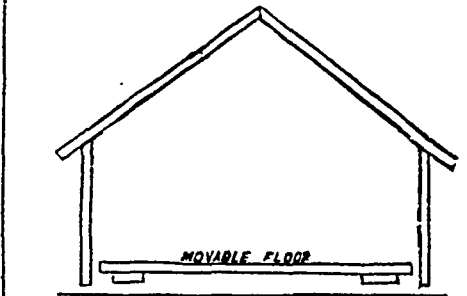


Fig. 6.

neath, and chickens are less liable to injury from that cause, but in a coop of this kind earth should be placed on the top of the floor, and frequently renewed, ordinary damp soil will do, placed in the coop an inch deep, it soon dries and forms an excellent deodorizer. The sides and ends of the coop must not rest upon the floor, but lap over so as to enclose it, the chicks thrive best when in contact with the earth. When the floor is wider than the coop, driving storms all the wet dripping from the roof would of course be caught by the flow and run directly underneath and under the hen while brooding her chickens; whole broods have in this way perished in a single night.

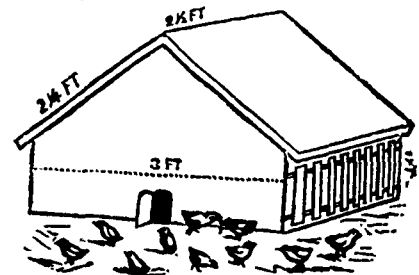


Fig. 7.

To impart a flavor to the flesh of fowls, such as constitutes the "game flavor" of the wild state, the Boston Journal of Chemistry recommends cayenne pepper, ground mustard, or ginger to be added to the common food of fowls.

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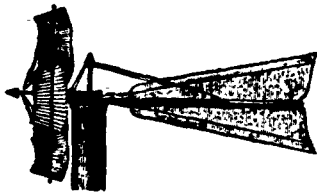
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CONTENTS OF THIS NUMBER.

Table with 2 columns: Section Name and Page Number. Includes sections like THE FIELD, AGRICULTURAL IMPLEMENTS, GRASSES AND FORAGE PLANTS, VETERINARY DEPARTMENT, ENTOMOLOGICAL DEPARTMENT, HORTICULTURE, FENCES, GATES, &c., APIARY DEPARTMENT, EDITORIAL, THE HORSE AND STABLE, BREEDER AND GRAZIER, THE DAIRY, POULTRY YARD, and ADVERTISEMENTS.

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