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THE CANADA FARMER

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The Field.

Soils.

In the operations of the field, it is with the soil, mainly, that the husbandman has to do. Air, heat, moisture, and other instrumentalities necessary to the earth's productiveness, are in wiser and better hands than ours. It is for us to study the nature of soils, to modify and improve them, to subject them to tillage, and keep them in the best possible condition for growing crops.

What we are accustomed to call "soil," is in reality crumbled or powdered rock. Rock of some kind or other underlies the soil at a greater or less depth below the surface, and often, as we know, protrudes itself into view, and then the slow but sure process of disintegration by which soil is formed, may be seen going on. As there is a great variety of rocks, so soils differ very much in their composition.

If this were a scientific essay, it would be proper to particularize and explain the numerous elements that enter into the composition of soils. To do this, is the province of the agricultural chemist, and it were well that every farmer should come under his teachings, in order fully to understand the philosophy of the business in which he is engaged. But our department is practical, rather than theoretical, and will serve its intended ends if it give enough of scientific information to explain the reason and necessity of things to be done, and awaken a craving for fuller acquaintance with the principles of agriculture.

Every person who has had any experience whatever in farming, is familiar with a number of phrases by which the various kinds of soils are distinguished; such as, a clay soil, a sandy soil, loam, clay-loam, sandy-loam, limy-clay, &c. All these have essentially the same components, only in different proportions. Clay, lime, and sand, are found in various degrees in them all. But these, however well proportioned, will not of themselves form a good, productive soil. There must also be a certain amount of what is philosophically called *humus or geine*, and is commonly known as *vegetable mould*. This produced by the rotting of plants, leaves, and vegetation generally. The leaf mould which we find in the woods, contains a large percentage of this material It is produced by the decay of leaves year after year, and the admixture of the decayed matter with the top soil.

The best natural soils are those which contain sand, clay, lime, and humus well mixed together. Such soils are found often in river bottoms, and in valleys, through which streams once flowed. Clay, sand, and lime have been washed down from the rocks, and mixed with decaying grasses, plants, and wood; layer after layer of this admixture has been deposited, until a rich, deep, fertile soil has been formed. The preparation of some of these soils has been the work of ages and generations, and such stores of fertility have been treasured up in them that the first cultivators of such soils have supposed them inexhaustible, and in many instances treated them as so; cropping them year after year without change of crops or supply of manure, until to use a homely American phrase, they have "gin out."

Nature is incomparably the best farmer, but natural processes in the production and improvement of soils, are slow, and can often be hastened by the use of artificial means. A soil in which sand predominates, can be made better by adding a proportion of clay to it, and it often happens that clay is to be found close at hand; sometimes it lies at no great distance beneath the surface. In like manner, a clay soil can be improved by adding sand to it. A too limy soil may be amended by an application of clay or sand, or both according to its character and wants. Humus can be supplied in the shape of manure, peat or swamp-muck, or decaying matter of any kind. Such improvements require time and toil, but they will amply repay them. "*There are no gains without pains.*" It should be the first and last aim of every farmer to have a soil or soils, for they may vary greatly on the same farm, in the best possible condition for growing all sorts of crops. This is as necessary as it is for the mechanic to have suitable material out of which to make the articles he manufactures.

Canadian farms consist almost wholly of lands originally covered with forests. When the trees were cut down, and the undergrowth removed, the soil was found fit to raise all manner of products. "What crops we used to raise when the land was new!" has been the exclamation of many an old settler. This fertility, remembered so well, was owing to the enrichment of the surface by the decay of leaves, plants, and fallen timber during the lapse of centuries. After a time, there is a change. The land no longer yields the large crops it did at first. What is wrong? Why, successive croppings have used up the store of plant food at first so abundant. Nature every year spread over the soil a coating of manure to make up for what the trees and saplings drew out of the earth. But man has not followed nature's example He has drawn out without paying back. Constant lavish spending will soon consume a store of wealth. So will constant cropping without manuring infallibly impoverish the soil. The hard work for small returns, the meagre yields per acre, which discourage so many farmers, are traceable mainly to this cause. In a too selfish eagerness to to get as much as possible *immediate profit*, the soil is robbed, and its ability to yield a liberal increase taken away.

If we could but once thoroughly impress this lesson on the mind and memory of every farmer, so that he should fix it as a principle of action, to be not only just, but generous in his treatment of the soil,—aye, and in his treatment of every thing and every body, the world would indeed be on the eve of a wondrous transformation.

Liming Land.

The use of lime is justly esteemed as one of the best means we possess for improving certain kinds of soils. On many soils the addition of lime is followed by increased fertility, and in numerous cases the improvement effected in this manner is so striking, that we cannot wonder at liming being ranked amongst the standard operations of agriculture.

Lime is required for the growth of all kinds of cultivated plants, and, consequently, is an indispensable constituent of all cultivated soils. But while lime is invariably present in soils that admit of cultivation, the quantity of lime naturally contained in them is often very small, and especially too small for the vigorous growth of certain crops. Hence the addition of lime to soils of this description must obviously increase their fertility. It is on soils of this kind that the most striking effects of lime are displayed, especially when, as is not unfrequently the case, a soil contains in abundance all the materials required for the growth of plants, with the exception of lime. In these cases, the addition of lime is all that is necessary to transform a comparatively barren soil into one of superior quality. To a less extent, the use of lime on ordinary soils is generally attended by good effects; and even on lime soils, that contain a large proportion of calcareous material, the use of lime of some other sort, or from some other district, is frequently beneficial. Hence we find that lime acts in the soil in several capacities.

Action of Lime on Soil.

It not only acts as a direct manure, by increasing the supply of a material necessary for the growth of nearly all plants, but it supplies us with one of the best means of altering the condition of substances already present in the soil, either by destroying or modifying substances that are objectionable and noxious, or by the conversion of indifferent bodies into useful fertilizing materials. For instance, a soil whose fertility is impaired by an excessive quantity of vegetable matter, as a peaty or boggy soil, may be relieved of this encumbrance by a copious dose of quick-lime. Lime, like all alkaline or caustic substances, possesses the property of rotting and destroying organic matter of every sort. Hence, on its addition to soils of this description, it quickly diminishes the quantity of insoluble vegetable remains. Vegetable remains, under peculiar circumstances, refuse to decay, and accumulate to an injurious extent. This kind of vegetable matter, popularly known as "sour humus," is generally found in undrained, or but imperfectly drained land. To remove this sour humus, lime is generally employed, which, by acting upon the insoluble vegetable matter, hastens its decay, and is said to "sweeten" the land; as by decay these materials furnish carbonic acid and other useful feeding materials for plants. The lime thus converts a noxious ingredient into a source of fertility. Again, in the case of soils that are infested with insects, a dose of lime is the least troublesome and most effective remedy.

In considering the agricultural value of lime, we must not forget its mechanical effect on the soil. When applied in large quantities to clay lands, it opens and loosens the dense masses of clay, and imparts a certain amount of porosity and mellowness; and by so doing opens the way to further improvements, by exposing a larger extent of surface to the action of the atmosphere.

Mode of Application.

The effects of lime in the soil, as above briefly enumerated, are most actively exhibited by lime in a

caustic or freshly-burned state; but also in a less degree by lime in other conditions. Whenever practicable, it is advisable to apply the lime as slaked lime. Burning and slaking reduce the lime to a fine state of division, so that, apart from the superior chemical effects of slaked lime, by using it in this condition we gain a further advantage, from its peculiar mechanical form, which admits of intimate admixture with the soil, and thus secures the fullest effect that lime is capable of imparting. In using lime in this condition, the lime is generally brought to the field in a caustic or hot state, and put up in small heaps, loosely covered with earth. In the course of two or three weeks the lime is completely slaked and falls to powder, which can now be easily spread over the land.

Quantity to be Applied.

The quantity of lime applied to the land in this manner will, of course, vary with the purpose it is intended to serve. If the lime is employed for a special object, as, for instance, to remove the excess of organic matter from old pastures when broken up, a copious dose of lime will be necessary; but when the soil has become deficient in lime, and an additional quantity is added, to act as a direct manure, a much smaller quantity suffices. Much difference of opinion exists amongst practical men as to the best system of liming the land. While some persons recommend a large dose at long intervals, other persons think it better to use a smaller quantity more frequently. Theoretically, we should think that, provided no reasons exist to the contrary, small doses at short periods would be the better system for obtaining the fullest effect of lime; since it is well known that everything applied to the land exhibits a tendency to sink in the ground, and bury itself beyond the reach of the plants.

Not a Substitute for other Manures.

In using lime as a manure, it must not be supposed that other manures can therefore be dispensed with. Lime is a special manure, and performs in the soil an office of its own sufficiently important to entitle it to a high place amongst manures; at the same time, it ought never to be used in place of farmyard manure. It is quite true that on certain fertile soils the addition of lime without any other manure is all that is necessary to insure abundant crops; and from this fact we might naturally infer, as many farmers have inferred, that lime is a substitute for other manures But this is a grievous error. Lime, by its stimulating effect on the soil, will for a time replace manure, by exciting the soil to supply sufficient material for the growth of several successive crops; but this supply is affected at the expense of the strength of the soil; it is drawing upon its capital, and must sooner or later feel the effects of this undue exhaustion.

On the other hand, the opinion entertained by some farmers of the exhaustive effects of lime in all cases, and that therefore it ought not to be employed, is equally erroneous. The fact is, no ill effects are likely to follow the use of lime, provided other kinds of manure are supplied in proportion: it is from neglect of this fact that most of the failures experienced in the use of lime are to be attributed.

Caution in Application.

Lime ought never to be applied at the same time with other manures; it is advisable to put off the application of other manures as long as possible to land that has been recently limed This precaution is the more necessary in the case of manures that contain combinations of ammonia; since lime liberates ammonia with the greatest ease from all its combinations. Hence the simultaneous application of lime and farmyard manure would probably be attended with a considerable loss of fertilizing material. No fear of loss need be entertained from this property of lime after it has been exposed in the soil for two or three months, as by this time all the caustic lime will have become carbonate of lime, and have lost its more active properties.

Fall or Spring Wheat.

There are parts of North America, principally confined to the great corn-growing belt, where the culture of winter wheat in consequence of the loss from freezing and other casualties has been discontinued. In these districts the principal dependence is necessarily upon the spring varieties, and where care is taken in the selection of seed, and in the preparation for the crop with early seeding a quality of spring wheat is produced that will yield flour of very high grade, and that is actually richer in the essentials of bread food than winter wheat But whenever winter varieties can be grown to advantage they are found to be more satisfactory, owing to their better yield, earlier ripening, and superior average quality While the superior merit in regard to quality is possessed by winter wheat, it is useless to advocate its culture in places for which from climate or other causes it is unsuited.—*Western Rural.*

Deep Ploughing.

It has been truly said that an increase of one inch in the average depth of ploughing throughout the United States, would produce a larger amount of profit, as compared with present results, than all the gold received from California. We believe in this assertion, says the *Working Farmer*; but we do not believe that all soils without being previously subsoiled are fit for this immediate increase in depth. We know that even clay subsoils, which approach within a few inches of the surface after being thoroughly subsoiled, are so ameliorated as to be capable of admixture with the immediate surface-soil: and we are equally well aware that subsoiling cannot be performed with any profit in clay subsoils containing excessive amounts of water; that such soils must be first underdrained and the subsoiling precede an increase of depth in surface ploughing. But there are millions of acres capable of being ploughed to double the depth to which they have ever received an incision from a tool of any kind, with increased profit. Even in the State of New York there are thousands of acres at this time, which have never been ploughed to a greater depth than four inches, composed of a loam entirely ready to be disintegrated by a surface ploughing to a depth of twelve or fifteen inches with increased profit and there are few soils that may not be at once ploughed to a depth of an inch or more than its former depth The adage "that many farmers own another farm immediately under that which they now cultivate," can not be too often repeated, and the judicious farmer, whose will has been so often quoted, as having informed his sons that he had buried a sum of money at a depth of twelve inches somewhere on his farm, and that they must find it, improved the quality of their products by the disturbance of the soil more than he would benefit them by the supposed legacy by direct bequeathment. Less manure will produce a larger amount of crops in a deeply disintegrated soil, and it is not true that the deeper you plough the more manure you require It is true that the more thoroughly manure is divided, the greater will be the amount of the crops procured, and this is the more certainly brought about by deep than it is by shallow ploughing.

No practical farmer can doubt that in deeply ploughed soils, crops are less annoyed by drouth and by insects; and if ploughing is useful at all, it must be useful precisely in the same ratio to the amount of soil disturbed, provided that the roots are capable of appropriating a greater amount of soil by its disturbance. Who doubts that roots will travel to the depth of twelve or fifteen inches, or even double that distance? Who doubts that the lime passing down through the soil, will rest on the surface of a cold and undisintegrated subsoil? Who does not know that many farms supposed to be worn out have been revived by the increase of a few inches in the depth of ploughing? Who will longer be contented to use a pitiful one-horse plough, skating it through the soil like a harrow with one tooth, when by deep ploughing he can more than double his crops?

Spring Wheat.

The prospect of good prices for wheat has seldom been better than for the coming crop of 1873. Farmers who have fields in fit condition for a crop of spring wheat cannot probably do better than by devoting them to that purpose this season. But the land must be suitable and in high condition if a profitable return is to be secured. We entirely agree with the *Western Rural* in saying that unless land is in good cultivation and comparatively free from weeds, wheat (whether fall or spring) ought not to be sowed. Heavy barn-yard manuring is injurious, causing an over growth of straw, which, especially in moist seasons, is liable to rust, lodge, etc; yet the application of well-rotted manure will be beneficial if plowed under in the fall, so that the crop may be sown as early in the spring as the frost leaves the ground, and it is in condition to work. The seed too must be put on uniformly, and the surface soil well pulverized and rolled. There are many varieties of spring wheat; some of which fail in one locality, but are found to give the best results in another; therefore, if a particular variety is by experiment found to be adapted to the soil and situation, it should be retained until by other cautious experiments the new variety is found to be successful. Every farmer should try to raise enough wheat for his own use at least, but it would be unwise to rush into wheat raising too extensively, because the crop happens at present to be higher than many of the other staples. The true maxims of the farmer should be diversified culture, rotation of crops, and better cultivation of the land; more grass, and more rest for the soil; more and better stock, and, which follows, more manure.

Fife Wheat for Winter Planting.

A farmer residing in Wisconsin recently published an account of his success in raising Fife wheat as a winter crop from seed imported from Scotland. He stated that he had tested it for three years and been completely successful. His crop in 1872 yielding 45 bushels to the acre. The same experiment has been tried in Canada with very different results. The writer tried an acre of it in 1851 after a crop of early potatoes. It stood a winter quite as well as the Fall wheat on the same field; it was a nice even crop, and yielded about 28 bushels to the acre. This was so satisfactory that the following season we sowed an acre with the seed we had raised. It came up well and looked as well in the fall as the winter wheat beside it; but speaking of it to a friend, he warned us that though Fife wheat did well enough the first year for fall planting it would not bear repeating. He said he had known several attempts made, but in in every case the plant was winter-killed, and this proved to be the case with our test acre. It was completely killed, while the fall wheat alongside of it was the best crop we ever raised.

Rotation of Crops.

An old French agriculturist gave the following seven rules as the fundamental principles of rotation:

1. However well a soil may be prepared, it cannot long nourish crops of the same kind in succession without becoming exhausted.
2. Every crop impoverishes a soil more or less, according as more or less is restored to the soil by the plant cultivated.
3. Perpendicular rooting plants and such as root horizontally ought to succeed each other.
4. Plants of the same kind should not return too frequently in rotation.
5. Two plants favorable to the growth of weeds ought not to succeed each other.
6. Such plants as eminently exhaust the soil, as the grains and oil plants, should only be sown when the land is in good heart.
7. In proportion as a soil is found to exhaust itself by successive crops, plants which are least exhausting ought to be cultivated.

PREPARING LAND FOR GRASS.—We are apt, very apt, to overlook the fact that land intended for grass should receive more thorough culture than any other, because for years while in grass, it has not the advantages of the plow and other implements to stir the soil, but must rest and pack and get more and more in a condition to keep out the air, and let in and pass off less readily the water. We should, therefore, thoroughly prepare the soil. Plow as deep as may be, and subsoil well; pulverize and enrich the land—enriching it will make it more mellow, and keep it longer in that condition, as well as increase the yield. Such land will "catch" its seed, and if plentifully applied, will be certain under anything like favorable circumstances to form a thick set. A little top-dressing, aided by the aftermath, which should never be fed close, will insure good crops—two cuttings a year. But let there be a cold, hard under soil, and the seed put in in the usual way—little of it and on hard and reduced soil, without manure—what can be expected of it? Just what we see; light crops, getting lighter each year till it will hardly pay for harvesting. Such land, when the plow turns it down, will be found to be hard. The sod amounts to but little, whereas, in properly treated land it will yield from 60 to 70 loads of manure per acre. A mellow seed-bed, deeply loosened soil well enriched, plenty of seed sown and sown as early as possible—are the points to be secured in putting down grass lands.—*Rural World.*

HARROWING WHEAT IN SPRING.—In reply to a correspondent who asks whether it is advantageous to harrow wheat in spring. The editor of the *Country Gentleman* replies that he has successfully harrowed wheat in spring, repeating the operation two or three times at intervals of about a week, until the wheat was a foot high or more. The result was quite successful, and the crop was increased over five bushels per acre. The implement used was the smoothing harrow, which pulverizes the earth, without injuring the plants. At the last harrowing, clover seed was sown, and it took better than another sowing early in spring in the usual way without harrowing. This mode of harrowing may be applied to wheat sown broad-cast or drilled equally well, and it makes little difference whether the harrow is run with or across the drills.—*Country Gentleman.*

Grasses and Forage Plants.

GRASS LANDS.

The economic and yet adequate sustenance of animals which contribute so largely to the comfort and usefulness of mankind, is scarcely inferior to the importance of securing the direct food supplies of the people themselves. And not only, in this point of view, is the subject of "Forage Crops" of incalculable importance to the agriculturist, but also from the fact that by the cultivation of the grasses he largely contributes to, and maintains, the fertility of the soil. Laying down land to grass is, now-a-days at least, an acknowledged method of resting and recruiting soil that has been impoverished by over-cropping. Hence the opinion that grass land improves in quality with age, the extreme reluctance with which permission is granted in Britain to break up old pastures, and the exceedingly high rents they return to the proprietor from the grazier.

But, whilst fully admitting the invaluable benefit derivable from laying down fields to grass, we must ever bear in mind that the good to be accomplished thereby is exactly proportionate to the *quality* of the land and the treatment it receives. We have indisputable evidence of this in the extensive commons, heaths and wastes, which, lying in pasture from time immemorial, have, even in the most highly cultivated countries, been considered so worthless as not even to be worth the outlay for enclosing It, therefore, follows that the mere laying down of land to grass will not make *all* soil *good*, whatever be the length of time it remains in pasture. It has also been ascertained that some grass lands will retain their good *heart* for a considerable period without manuring; whilst others, again, if grazed, cropped with sheep, or mowed for hay, will gradually deteriorate unless some fertilizing stimulant is applied in accordance with the nature and requirements of the soil.

Among the undoubted benefits realized from leaving land in pasture is the gradual accumulation of a dark brown soil, rich in vegetable matter, thickening or deepening in proportion to the age of the pasture. It seems to be a law of nature that this accretion takes place more rapidly in temperate than in tropical climates, as if it was intended that by the more speedy absorption of the sun's warmth by this dark mould, vegetation would be more easily promoted, a matter of great importance in countries where the summer is comparatively short. In light and sandy soils this deepening of vegetable mould is more readily arrested than on soils of a heavier character. The roots of the grasses are also extensive contributors to the formation of this vegetable mould. Professor Johnston declares that on an average the *annual* production of roots on old grass land is equal to one-third or one-fourth of the weight of hay carried off, varying no doubt with the character of the grass and the soil. If a field yields two or three tons of hay per acre, it is calculated that from half a ton to a ton of dry roots is produced and left in the soil. It is also asserted that in many wheat fields the quantity of straw left in the form of stubble and roots is oftentimes greater than the quantity carried off in the sheaf. It will thus readily be seen how great an accumulation of rich vegetable mould takes place every year a field is allowed to remain in pasture.

But there are other agencies at work in the formation of mould, such as the penetration of the roots of the grasses to the subsoil, opening up a way for the rains which carry downwards along with them a certain per-centage of the surface soil. Then, again, there are the heats of summer and the frosts of winter, causing contraction of the soil. In a dry summer the welcome rain falling on a parched field or a thaw in winter, makes the earth expand, whilst the roots of the grasses remain nearly fixed; in consequence, the soil rises up among the leaves, mixes with the vegetable matter, and assists in the production of the mould.

Cultivation of Rape.

Rape is cultivated in this country, not for its seed, but for its leaves as a forage plant, and a more wholesome food for sheep is not raised on the farm. It is raised in summer to be consumed in autumn. The culture up to the sowing of the seed, is precisely the same as for turnips, though it does not require the same quantity of farm-yard dung as the turnip.

The culture of rape ceases after the sowing of the seed, as the crop is not thinned out like turnips or the other rooted green crops, the object being to raise a sufficient number of stems to produce a large crop of leaves, for which purpose 2 lb. of seed to the acre will suffice; and as the seed is large compared to that of the common turnip, and about the size of that of the swede, that quantity will not produce too many plants to stand in the drill. Rape seed affords 810 seeds to one drachm, and weighs about 53 lbs. to the bushel. The turnip sowing machine is used for sowing the seed, using one of the larger-sized holes in the seed-box. When weeds make their appearance before the plants are sufficiently advanced in height to keep them down, the scuffler, drill grubber, and double mould-board plough, must be put in requisition to remove them, and place the ground again in its proper form and state.

Rape will grow on almost any soil, and certainly well on clay, on which it requires less manure than on hard loam; but it grows on none so well as on drained marsh land, resting on a clay subsoil.

Rape is chiefly raised to be consumed by sheep, by folding on the land, for the double purpose of manuring the soil and fattening sheep; and to attain both ends the rape seed is sown in June and July, and the crop is ready for being folded on in September and October.

A correspondent of the Albany *Cultivator* says that if the crop is to be hand-hoed, the drills may be only ten inches apart, but if the horse-hoe is to do the work, the drills will need to be twenty inches apart or more. The after culture consists in keeping the ground stirred occasionally and free from weeds. The plants are allowed to grow pretty closely together in the rows, and as soon as they get about eighteen inches high the stock to be fed on them may be turned in, allowing them only an hour a day for the first week, and not more than two hours a day at any time till black frost comes, when they may be allowed full range to finish up the crop before winter. In England it can be fed off all winter, but in Canada the frost is too severe, though not sufficiently so to kill out the roots, which, if left in the ground will produce a crop of seed the next season. This it is desirable to avoid, as the seed crop is very exhausting to the soil, though the leaf crop of the first year is not. Hence great care should be taken to plow under the roots as soon as they show signs of vitality in the ensuing spring. Even then some will escape and start growing among whatever crop may be sown on the land. Such plants must be pulled up by the roots as soon as they can be seen growing. Rape is a good crop on which to feed milch cows in autumn to obtain a flow of milk at a time when the pastures are comparatively bare, but they must not feed to excess on it, as it is very stimulating, and liable to cause abortion in some cases.

Nutritive Value of Grass.

The *American Rural Home* gives some interesting experiments that have been made by German chemists, on the nutritive value of meadow grass at different periods of its growth and upon hay cut at different seasons. An elaborate series of analyses show that young grass is more nutritious than mature grass. and physiological experiments show that it is more easily digestible. Thus grass two and a-half inches high contains nearly fifty per cent. more of albumenoids than grass which is six inches high, and about ten per cent. more of "crude fat" (5.24 per cent. against 4.82). The mature grass contains more woody fibre and less ash than the young grass, and besides this, it is found that the nutritious albumenoids exist in a less soluble form in hay than in young grass. Hence the difference of nutritive value and digestibility. Autumnal hay was found to be more nutritious and digestible than summer hay. Some qualifications as to this result must be made for the West, inasmuch as it was obtained from German hay, grown in a moister summer climate than ours. Similar experiments were made by E. W. Wolff on clover. He found that its digestibility diminished during the four weeks from the beginning to the end of flowering. while the digestibility of clover hay was about the sam. as that of green clover cut at the same stage of growth.

Prepare Land for Turnips.

In a few weeks we shall again be on the land, busy with the ploughs and harrows. If the land intended for turnips this summer was properly manured, and ridged and furrowed last autumn, there will be little difficulty in getting it ready for the seed, as soon as the season for sowing turnips comes on. To see this effectually, we must bear in mind that the great cost of growing root crops, arises from *weeds and their destruction*. Were it not for *weeds*, turnip growing would be easy work. But weeds will come, and the only way to contend effectually with them, is to harrow the rows lengthwise at intervals from the first of spring with a very light harrow. By this course the young tender weeds are killed as fast as they germinate. They may not be visible, but they are there, and if let alone, they will show themselves at a moment when you cannot stir the soil and soon cover the ground and stifle the turnip. Where turnips will grow, weeds will grow, and if weeds are allowed contemporary growth, turnips cannot flourish.

If the land has not been manured and prepared last autumn, it ought to be ploughed at the earliest possible moment in spring If the ploughing is left until the season for sowing turnips arrives, and no harrowing consequently done to destroy the young weeds, turnips and weeds will grow together, and the labor of subduing the weeds will be trebled. By properly attended to the cleaning of the land before seeding, there ought not to be any hand-hoeing required, until the turnips are several weeks high; singling must of course be done as soon as required; but one hoeing by hand ought in ordinary seasons, to be sufficient. Three hoeings are absolutely requisite, but hand hoeing is very expensive, and the necessity of manuring too should be avoided when possible, consistent with the production of a good crop. We must have roots, if we would have good cattle, and without cattle, our manure supply would be a scant one.

Hungarian Grass.

During the last season, in consequence of the drought, many farmers prepared for the shortness of the hay crop which was threatened, by the substitution of grass seeds of rapid growth. Among these Hungarian grass was very prominent, and, so far, our accounts all concur in the report of a great and satisfactory success, the yield being generally very large, and the quality such as to be very desirable, either for soiling purposes, or for curing for winter supplies. Mr. Chalkley Harvey, of Pennsylvania, has raised it for several years, and he writes thus:—

"On one occasion he had been feeding his cattle for some time upon it, and after it was all gone, and they had to go back to common hay and fodder, there was a marked declension in their appearance, especially in the glossiness and smoothness of their coats. This he attributes in great measure to the large amount of oil contained in the seed. He stated that if two horses were taken alike in other respects, and one was fed all the good Hungarian hay he would eat, and the other had common hay, and 8 quarts per day of such oats as we commonly raise in Chester county, of later time, that the horse fed on Hungarian alone would appear and thrive the best."

Another great consideration with this grass is, the *short time* it requires to mature the crop. An evidence of this is given by the correspondent alluded to above, who, in sixty-four days from time of sowing, harvested a crop, having a piece of ground of a deep, mellow soil, which accurately measured, was found to be 1 1-16 of an acre. He gave it a good coat of barn-yard manure, and sowed the seed on 21st May, (1¼ bushels,) a nice shower of rain soon afterwards came on, and it grew luxuriantly, and on the 24th and 25th July, he cut and cured over a ton of good dry hay, which he saved for winter use.—*Farmer.*

Grass Seed for Groves.—In reply to a correspondent, who asks what is the best grass to sow in an Oak Grove, the Editor of the Albany *Country Gentleman* replies that a mixture of the seeds of the small growing English grasses for this purpose, answers well. Downing recommended a mixture of red-top and white clover for America, while others prefer Kentucky blue grass as the main or sole kind. Either of these would do well. but the latter would probably succeed best for a fine lawn in the shade of trees. The best time to sow is very early in spring, the ground having been previously well prepared by rendering it perfectly clean, and the surface rich and mellow. The quantity of seed should be large, so as to make a very dense carpet of green,—usually at the rate of two or three bushels per acre. The seed should not be covered more than a fourth of an inch, for which purpose either a fine brush or a roller may be used on a perfectly mellow surface after sowing.

Agricultural Chemistry.

II. WATER.—*Continued.*

In the last number of the Canada Farmer, we described the way in which water can be decomposed into two gases, oxygen and hydrogen, and we then gave a short account of the first of these gases and its relation to animal and plant life. We will now consider the other constituent of water, hydrogen. One way of procuring this gas, we described in our last paper while speaking of the decomposition of water by means of a galvanic current. Red hot iron will decompose water in the same way, but hydrogen is usually procured by acting on water and sulphuric acid with zinc or iron. A bottle is furnished with a cork perforated by a bent glass tube, and into it are placed scraps of zinc, water is poured on the zinc, and sulphuric acid added till a brisk effervescence indicates that the hydrogen is escaping. It may be collected over water in the same way as oxygen

Sulphuric acid, or as it is commonly called *oil of vitriol*, consists of hydrogen combined with oxygen and sulphur. When it is brought into contact with zinc, the zinc displaces the hydrogen and forms a compound of zinc, oxygen, and sulphur which is known as sulphate of zinc, the hydrogen at the same time escaping as a gas. The sulphate of zinc remains dissolved in the water, from which it may be obtained by evaporation in colorless crystals If iron were used instead of zinc, sulphate of iron, or *green vitriol*, would be formed in place of sulphate of zinc.

Hydrogen, like oxygen, resembles common air in having neither color, taste, nor smell. It is the lightest substance known, being only one-fifteenth as heavy as air, and only one-sixteenth of the weight of an equal bulk of oxygen. Hydrogen will take fire on the application of a light, and burn with a pale flame. This flame, although it gives very little light, is very hot. A mixture of hydrogen and oxygen will explode with considerable violence if brought in contact with flame. The explosion is caused by the two gases uniting together to form water, If the mixture contains two volumes of hydrogen and one of oxygen, it will be entirely converted into water, and both gases will disappear altogether. It will be remembered that when water was decomposed by the galvanic current the gases were evolved in these proportions. Hence we see that water is composed of oxygen and hydrogen united, in the proportion of one volume of the former to two of the latter; and, as oxygen weighs 16 times as much as an equal bulk of hydrogen, the composition of water *by weight* will be 16 parts of oxygen and 2 parts of hydrogen. In other words 9 pounds of water will contain 8 pounds of oxygen and 1 pound of hydrogen.

When hydrogen burns in the air, water is produced by the combination of the hydrogen with the oxygen of the air. The formation of water in this way may be shown by allowing the hydrogen to escape from the bottle, in which it is being generated through a tube drawn out to a fine point and setting fire to the jet of gas as it issues from the tube.

The hydrogen will burn with a small pale flame, and if a cool glass be inverted over the flame, drops of water will be deposited like dew over its inner surface. If hydrogen is mixed with air, it will explode on contact with a lighted match, but as air only contains about one-fifth of its volume of oxygen, the explosion is not so violent, and a larger quantity of air has to be employed than the quantity of oxygen which will suffice to explode the hydrogen.

In order to understand the manner in which these two gases unite to form water, it will be necessary to say a few words about the constitution of matter in general. We look upon matter as being made up of particles so small as to be entirely beyond the reach of our senses To these particles we give the name of *atoms*, a name which signifies that they cannot, so far as we know, be divided. Elementary bodies are made up of atoms of one kind. Compound bodies, on the other hand, consist of two or more kinds of atoms united together chemically. Thus oxygen is made up entirely of atoms of one kind, and hydrogen is made up of atoms of another kind, but water consists of *one atom of oxygen united with two of hydrogen*. The atoms of the various elementary substances differ in weight. The atom of oxygen weighs 16 times as much as the atom of hydrogen, and hence water must contain 16 parts by weight of oxygen and two parts by weight of hydrogen. Again, equal volumes of elementary gases always contain an equal number of atoms. Hence two volumes of hydrogen and one of oxygen unite to form water which contains two atoms of hydrogen and one of oxygen. These atoms, for the sake of shortness, are represented by symbols. Thus O represents one atom of oxygen, and H represents one atom of hydrogen. Water, which consists of one atom of oxygen and two of hydrogen, is represented by the *formula* H_2O. The symbol O also stands for 16 parts by weight of oxygen, and the symbol H stands for 1 part by weight of hydrogen. As hydrogen is the lightest substance known, the weights of the other atoms are all compared with the weight of one atom of hydrogen. The numbers which express the weight of the atoms of the elementary bodies compared with the weight of one atom of hydrogen are called their *atomic weights*. The formula of water, H_2O, signifies that water contains two parts by weight of hydrogen and sixteen parts by weight of oxygen.

Pure water contains nothing beside hydrogen and oxygen, but water from natural sources is never pure. Rain water always contains certain gases dissolved in it, which it absorbed in falling through the air. These gases are nitrogen, oxygen and carbonic acid. They may be expelled by boiling. Well, spring and river waters contain, in addition to these gases, a variable amount of solid matters obtained from the soil and from the rocks over which they pass, such as various salts of soda, lime, and magnesia, and also more or less *organic* matter, derived from decomposing vegetable and animal substances. The presence of the salts of lime and magnesia confer upon water the property of *hardness*.

Soap consists of a fatty acid combined with an alkali. Salts of lime and magnesia decompose soap, the fatty acid uniting with the lime or magnesia and forming the curdy flakes which are always formed when soap is used for washing in hard water. Hardness is of two kinds—*temporary* and *permanent*. Temporary hardness is caused by the presence of carbonate of lime. This salt is insoluble in pure water, but dissolves in water which contains carbonic acid. When water is boiled, the carbonic acid is, as we have seen, expelled, and the carbonate of lime falls down as a sediment, leaving the water soft. The addition of more lime, which unites with the free carbonic acid to form carbonate of lime, produces the same effect. Thus, water whose hardness is due to the presence of lime may be sometimes made soft by the addition of more lime. Sulphate of lime renders water permanently hard. Such water cannot be softened by boiling. The addition of carbonate of soda (washing soda), however, removes the hardness in this case as well as the other, by decomposing the salts of lime and magnesia, forming carbonates which are insoluble in water.

A correspondent writes to the *Country Gentleman* strongly urging one or other of the following mixtures as manure for potatoes:—1. One part salt, two parts plaster and four parts of unleached ashes. 2. One part salt, two part plaster, three parts lime and four parts of ashes; mix thoroughly and apply a tablespoonful on, or with the seed at the time of planting. Plaster (gypsum) alone is excellent as a top top-dressing. Ashes alone are always good for any crop, and and potatoes want nothing better—the trouble is to get enough of them.

Entomological Department.

ENTOMOLOGY, PAST AND FUTURE.

It has not been the practice of the Editor of the Entomological Department to "sound his own trumpet" in these columns, or to make much allusion to his own performances; nor indeed can we think that any of the editorial staff of the Canada Farmer have been deficient in that virtue of modesty which is said always to accompany true merit. We trust then, that the reader will pardon in the writer any seeming departure from a fitting abnegation of self on the present occasion, as it is the first and will probably be the last time, when he will inflict upon those who take an interest in this department any prominent putting forward of his own personality. As, however, this publication is entering upon a new phase of existence, with brighter prospects and higher aspirations for the future, we deem it not out of place to say a few words upon what we have done in the past, and what we hope to be able to accomplish in the time to come.

Nearly eight years have gone by since the writer first became connected with the periodical, and commenced his contributions upon Entomological subjects. Since that time, with the exception of the closing months of last year, his department has been maintained with more or less regularity and fullness, and has been the evident means of attracting great and general attention to the importance of a thorough scientific knowledge of our insect friends and foes. So marked, indeed, has been the influence of this work upon the public mind, that it has not only developed a popular interest in the subject throughout the Province, but has been instrumental to no slight extent in causing the legislature to devote an annual grant to the Entomological Society, and to cause a report to be published yearly upon the noxious and beneficial insects of the country.

In looking over the back volumes of the Canada Farmer, we observe that the first notice that appeared in this country, the first too, as far as we know, that appeared in America, of the gooseberry and currant saw-fly (*nematus ventricosus*), that most destructive pest, was a long article by the editor of this department, in August 1865. Again we observe that we were the first to draw public attention in the spring of 1870, to the expected invasion of the country by the Colorado Potato Beetle, which duly happened in the following summer; and the first to give to the farmers of Canada reliable illustrations of the insect, and *information respecting* its habits and the best modes of dealing with it. Another matter upon which we pride ourselves is that we believe we have completely killed out by reason and ridicule, though at the risk of a libel suit! the absurd superstition that the tomato-worm is a frightfully poisonous creature, and the destroyer of many human lives annually! We do not like to feel too sure of our success in this respect, but as a whole season has gone by without a single startling paragraph on the subject, in any Canadian newspaper, we fancy that our efforts have not been in vain. Apart from these special topics, however, no one can refer to the past eight volumes of the Canada Farmer, without finding a vast mass of information respecting insects of almost every kind, destructive, beneficial, curious, innoxious, or neutral, affecting the field-crops, the fruit-trees, the vegetables, the flowers, the house-plants, the forest, acting as parasites, as scavengers, as fertilizers of plants, as plagues, as blessings, in short, insects have been treated of in all their relations to mankind, in all their states and stages of existence.

But though so much has been done, the field is so vast, the number and variety of these creatures is so enormous, that the work can never be brought to completion. As long as the world lasts there will always be something more to learn, something fresh to relate about these ubiquitous creatures. Every year, indeed, we seem to hear of some fresh plague, some new insect foe, that had not troubled us before. We have lately had the arrival in the west of the Colorado beetle, and in the east of the English cabbage butterfly; while now from the south we are threatened with the asparagus beetle. Each crop in turn seems to be the object of some new work of the destroyers, and no sooner are we finished with one, than a new combat has to be entered upon. Such being the case, the necessity and the value of this department of our journal, are in no wise diminished by the amount of work that has already been performed in it, but it continues as important as ever, and requires

for its proper maintenance the highest scientific knowledge that can be obtained in the country, and the closest observation that can be brought to bear upon the objects of its investigation.

In order to maintain the interest and efficiency of the Entomological department, we propose to take up, in successive numbers, the various insect enemies of the farmer, orchardist, and gardener; to describe and illustrate the various insect pests of the field, the garden, the orchard, the forest, the conservatory, and those too that effect our domestic animals and that are a plague to the careful house-wife. We shall endeavor to render them easy of identification by any intelligent reader, making free use of the artist's pencil to render clearer the efforts of our pen. We shall aim at giving the most reliable methods of dealing with insect foes, both by the use of artificial remedies, and by the encouragement of natural checks, and we hope, with the co-operation of our readers, to disseminate throughout the length and breadth of our land, true scientific knowledge of this portion of the animal kingdom.

Roseleaf-Cutter Bee.

(*Megachile centuncularis.*)

During the summer, we noticed bees continually under our outside window-blinds, with pieces of leaves in their mouth. They would always ascend the line which drew up the shades, and then pass through the hole where the pulleys were placed Having disappeared, they would remain for some moments out of sight, descending to the garden in the same manner. If sometimes a bee considered it knew its way well enough without the cord, and ventured to find the entrance, it soon came down from the top of the window and began the good orthodox ascent up the line and through the pulley-holes. The wood-work of the blinds was too closely fitted for us ever to get a peep at what was going on. But to-day the summer being over, we had our shades down, and in the groove along where the cords ran at the top part of the window we saw the Roseleaf-cutter Bees' summer occupation Just fitting and rolled up like cigars, we found several inches of these ingenious nests, about half an inch square. I have with a penknife gently opened one, and soaked another in water. Then I found as Réaumur describes, that the bees had taken advantage of the natural curling of the leaf on drying, and had not needed any gluten to fix the cut pieces. Each separate nest had one rounded end, which fitted into the convexity of the other; so that on first seeing the strange green roll I thought each join denoted a day's work. Having broken off one compartment, I proceeded to lift off the outer coverings—there were nineteen pieces; then I lifted off the rounded end which closed up the mouth—there were twenty of these exact, neat rounds, beautifully moulded into shape. Within this warm nest was a quantity of soft pollen and honey; then a hard case, in one instance, with burnished inner walls, in which lay a white soft maggot or grub; in another this hard cell was wanting. There were in all twenty-four nests, the leaves still retaining their green. I have read that this bee generally digs in the ground to build its nest; here, just above the rose-bed over the window, we found our summer lost leaves. Have your readers met with buildings in similar localities? Can you also tell me if one bee would make more than one nest; and if the worker is the parent of this concealed white plump grub?—A. Young, "*in Science Gossip.*"

Carbolic Soap for Insects.—A few days since, I tried an experiment with carbolic soap in killing insects upon green-house plants, particularly the green fly (Aphis), which, as everybody knows, is a great pest, and one not readily destroyed, except by fumigating with tobacco—not a very agreeable operation to perform upon parlor plants or in a conservatory attached to a dwelling. My first experiment with this soap was a decided success, operating upon two hundred roses just in bloom, and it was conducted as follows:—Into a pail of warm water I put a lump of soap the size of a small hen's egg. The soap was cut up into small pieces and the water agitated until it was all dissolved, forming a warm suds. The water should not be too hot, but if not above 120° or thereabout, it will do no harm Into this suds each rosebush was plunged (holding the pot inverted in the hand) and kept there about half a minute. After plunging, the plants were set aside for a few minutes, then dipped in the same way into clean water, shaking them about thoroughly, washing the leaves, and then returned to their former place in the house. Whether it was the soap or warm water that killed the green fly I will not say, but there is one thing certain, they are all dead—*Rural New Yorker.*

Apiary Department.

Shall I go into Bee Keeping?

We are vain enough to think that our former article on bee keeping, may have inclined not a few readers of it to entertain the idea of keeping bees. But there is one great and terrible hindrance which meets beginners at the very outset, and often effectually deters them from the contemplated undertaking,—it is the *fear of being stung.* Many own this, and others who are too proud to own it, are nevertheless influenced by it.

Now it is no mark of wisdom to make light of a bee-sting. It is no joke. A mosquito-bite, or if you can imagine it, fifty mosquito-bites in one, are as nothing to it. The bee not only inflicts a wound, but injects a poison. This poison is very subtle and virulent in its nature. It has a peculiarly potent effect on some people. A bee-sting has been known to cause death, when inflicted in a highly sensitive part of the body of a delicately-organized person.

Thus, much admitted, let a few considerations *per contra* be urged. In the first place, there is far less danger of being stung than most people imagine. The idea that every bee you hear buzzing around you, is intent on plunging its dagger into your quivering flesh, is preposterous. The ordinary buzz of a bee is its song of labor, an audible proof that it is intent on work, not on mischief. A bee rarely stings except as the result of injury or provocation of some sort. If interfered with in any way, and particularly if irritated, squeezed or crushed, it is pretty sure to sting. Like a Scotchman, the bee has for its insigna, a thistle, and for its motto, "Nemo me impune lacessit."

Secondly, there are simple precautions to be observed in all operations amongst bees, by which all danger of being stung, may be obviated. Ordinarily a quiet, self-possessed behaviour amongst bees ensures safety. All sudden movements are to be avoided. Bees are excessively nervous insects. They get excited in a moment. Gentleness must be practised *always.* If they raise a warning note of anger, or dart towards you threateningly,—the usual indications of a disposition to sting,—the best course is to stand perfectly still, bending the head forward to protect the eyes, as strange to say, bee-practice is the same as pugilistic, to *hit in the eye.* With the head bent forward, there is really very little of the face or body exposed to a straight forward attack, and such only bees make. It should be a fixed purpose *never to strike at a bee.* Only an experienced and cool bee-keeper can ever do that safely, and even such at times make a miss and get the worst of it. A perfectly self-possessed and skilled apiarian can sometimes get rid of immediate annoyance, by the sacrifice of a bee's life, but even this is not a practice to be commended. A bee struck at becomes infuriated, maddened,—and returns to the onslaught determined to "do and die." But we recommend all beginners to arm themselves with a veil and a pair of sheepskin gloves, when they have occasion to meddle with bees. The veil must be a close one, for these are prying little insects, and when they alight on a veil will crawl and crawl, hither and thither, and if there be an opening, are pretty sure to find it. A bee, however peaceably inclined, will sting when it finds itself in "a tight place." Those who keep apiarian supplies for sale have suitable veils, and as for gloves, there is nothing better than those used in harvest-time in handling grain infested with thistles.

Thirdly, modern apiarian science has discovered a short and easy method of taming or subduing bees. A few puffs of smoke from a bunch of burning rags, a pan of chips, or a bit of rotten wood, will usually quiet a colony of bees so that it can be handled with impunity The explanation of this is, that the smoke excites a slight panic in the hives, so that the bees at once fill themselves with honey, and when gorged with honey they are disinclined to sting.

These considerations ought to suffice as an antidote against the fear of being stung. If they do, and the determination is formed to go into bee-keeping, this advice should be followed:

1. Do not rush in hot haste into this pursuit. Read up in regard to it. Master the first principles of the business before you get a hive of bees. Be content to begin in a small way, and take time to gain experience. One stock of bees is ordinarily enough to begin with.

2. Obtain if possible a colony of bees in a *movable-frame* hive. Bees have been kept profitably, and may be still, in straw or common box hives, but to attain the best results, a movable-frame hive is necessary; with this, there is access to the bees, and perfect control over them. With this, more may be learnt about bees in a single season's observation than by keeping them a dozen years in straw or box hives. Such a hive can easily be obtained from some of our Provincial apiarians, such as Attwood, of Vanneck; Mitchell, of St. Mary's; Losee, of Cobourg; Nicolle, of Lindsay, &c. A stock of common bees in such a hive will cost about ten dollars, inclusive of patent right.

3. Do not expect sudden and wonderful profits, nor be discouraged by reverses at first. There is no speculation in bee-keeping. Nevertheless, after some year's experience we firmly believe there are few directions in which a little time and money can be more judiciously expended. To be sucessful, however, will require diligence, care, energy and perseverance.

Facts Concerning Bees.

When the queen bee is forcibly taken away from the hive, says the *American Bee Journal,* the bees which are near her at the time do not appear sensible of her absence, and the labors of the hive are carried on as usual for a time. It is seldom before the lapse of an hour that the working bees begin to manifest any symptoms of uneasiness. They are then observed to quit the larvæ which they had been feeding, and to run about in great agitation to and fro; and on meeting with such of their companions as are not yet aware of the disaster which has befallen them, they communicate the intelligence by crossing their antennæ and striking lightly with them. The bees which receive the news become in their turn agitated, and spread the alarm further. All the inhabitants now rush forward, eagerly seeking their lost queen. But finding search useless, they appear to become resigned to their misfortune, the tumult subsides, and if there are worker eggs or young larvæ in the cells, preparations are made to supply the loss by raising a new queen, and the usual labors of the hive are resumed.

For feeding bees: Take at the rate of five pounds of refined or white sugar, two gallons of soft water, one tablespoonful of salt, ten grains of cream of tartar; put all together, bring to a boil, skim, and, when cold, add eight ounces pulverized slippery elm bark, or fine oatmeal, stirring well—then feed in the hive. During the summer, use but four pounds of sugar.

Italian bees gather much larger stores of honey than the black bees. Dzerzon, the great German apiarian, after many years' experience, says that the profits of his apiary have been doubled since their introduction. They are also much more peaceable than the black bees.

Bees in England.

An apiarian writes to the *Gardener's Chronicle,* Eng., of the bee season of the last year, thus:

"Taking a retrospective view, the past bee season has been the worst that I have experienced for many years. Although the winter was so mild, my bees suffered very much from damp, and their numbers had decreased considerably by the new year. In this neighborhood we depend a good deal on the flowers of the horse chestnut for an early start; but this spring the chestnut trees were so injured by the cold, piercing winds, that many of the blooms dropped off before expanding, and the result was, I had to began feeding at a time when swarms are usually expected. I looked forward with some anxiety to the lime trees; but, they, too, had evidently felt the effects of the cold spring, as their flowering season was of short duration. Every beekeeper reckons on a few losses during the winter and spring months; but my list this year is a long way above the average."

His idea of a young hive is as follows:

"After a run of nearly forty years I have settled down with a wooden double-sided hive, verging on the old double glazing principle. The sides or walls are made of pine, five-eighths inch stuff, with a space quarter of an inch between, all round. The corners are not dovetailed, but lapped, as a carpenter would say All the joints are bedded in white lead, so that the space or vacuum may be as nearly air-tight as possible; much depends on this, as well as on the size of the vacuum. If not perfectly close it is useless, and if too large it is equally so. All that is required is just enough for the warmth of the bees in winter to rarify. The whole hive is so simply and easily made, that it comes within the reach of everybody."

Rural Architecture.

A Good Country House.

The designs here presented are of a comfortable family residence for a prosperous farmer; but are equally suitable for a village house. It is a commodious structure, and provides all the conveniences required for either purpose. The size of the main building, as drawn, is 36 by 34 ft., and of the lean-to, 24 by 21 ft. The drawings are for a frame house, but can, of course, be used for brick or stone.

FAMILY RURAL COTTAGE—FRONT ELEVATION.

It will be seen that the main building is so separated from the wing, as to enable the work-hands to enter the latter by a different door and have their apartments to themselves—the rooms of the family being all in the main building. The cellar is built of stone, with a convenient stair down to it—and it can be made as large as desired. The attic story has a good stair-way leading up to it, and can be finished off, if desired, so as to provide two large rooms.

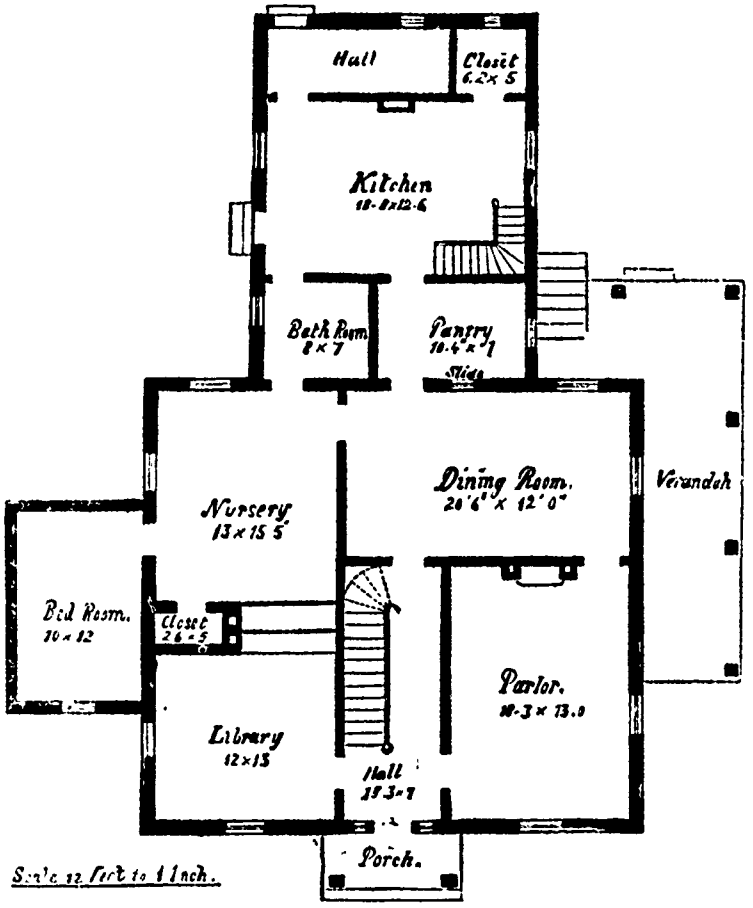
Brick flues provide thoroughly for heating the rooms and halls—and ample provision is also made in the way of pantries and closets. A bath-room is included in the plan, with access from the nursery and the kitchen.

The roof is somewhat in the Swiss style. It projects considerably over the walls and affords protection against rain and snow-storms. The roofing can be done either with shingles or slate laid in mortar or on asphalt felting.

The outside walls are intended to be sheated by 4-inch narrow sheating, beaded, nailed to rough-boarding, diagonally, which is covered with asphalt felt, or better even, with the newly introduced—*cane and tobacco felting*. This secures a warm house in winter, which is a great saving of fuel. The frame ought to be a strong one, well braced on corners.

A house like this where lumber and stone are near at hand, may be erected at a cost of between $2,500 and $2,800. including venetian blinds to the windows and proper painting inside and out. The roofing over the bed-room attached to the nursery may be of felt or galvanized iron.

It has been well said by a western cotemporary that no inhabited country can be really beautiful without neat and tasteful dwellings for the people. No home can be the true "Home, sweet home" of the poet unless, no matter how humble, it outwardly evinces the sweetness, the purity and the grace that exist within. To meet the true and rational idea of a handsome rural house, the lavish expenditure of money is not needful. A beautiful landscape is almost as often ruined, in its effect, by a costly, but ill-proportioned and unsightly dwelling, as by the unpretentious, yet shabbily built and more shabbily kept cabin. There is an elegance in simplicity that is harmonious and appropriate, in country houses, which the expenditure of wealth can hardly heighten. Cheap, or moderately cheap houses, need not be outwardly ill-shaped nor inwardly inconvenient. The love of adornment is innate in man. The very savage rudely practices the ornamentation of his body, and he decorates his habitation, however primitive it may be. In civilized man this natural taste becomes educated, and he distinguishes himself in the proper expression of it, by his selection of a site for his home, the construction of his buildings, the grouping of trees and shrubbery, and by tastefully laid out walks and well kept lawns.



GROUND FLOOR.

Concrete as a Building Material.

In localities where coarse sand and gravel are abundant, the *concrete* wall will be found, in many respects, desirable. Its chief points of excellence are cheapness, ease of construction, and durability; and for all buildings of a medium size, in favorable localities, it is preferable to any other. A prejudice has existed against concrete work, (which fortunately it has nearly lived down), on account of a few failures resulting, principally from want of a proper knowledge of the ingredients and their proper use. The construction of foundations and superstructure walls, of earth, sand and gravel, with some cementing medium, as cement or lime, is not new, or very uncommon. *Pise*, a species of concrete wall, was practised at a very early period in France. It was also known and used to a considerable extent in Italy and Spain, and, at a more modern date, in England, as illustrated in Woburn Abbey, by the statement of Montbrison.

Four and six-roomed houses for working-men are now built in London and Paris, at a cost extremely low in comparison with buildings of other materials, and with evident system and thoroughness, and in the United States concrete buildings are being extensively erected.

There are three methods of making a good concrete. The ordinary mode, and the one most successful and most economical, where the locality supplies sand and gravel, is thus described by the eminent U. S. architect, Mr. D. T. Atwood:—

In the case of a medium size building, two stories high, plan to build the wall 12 in. thick; construct moulds of rough 1½ or 2in. plank, about 8 ft. long, 12 in. wide, and 12 in. deep. If a number of piers are likely to occur, between doors and windows, less than the length of a mould in breadth, then construct some shorter moulds to accommodate these piers as nearly as possible, secure the moulds together, and in their proper position, by fastening the four lower corners with ⅞-inch wrought iron rods with screw thread and nuts on the outer ends, to turn up on the outside faces of the plank, until they are adjusted to the thickness of wall. Secure the tops with iron holdfasts of ¼ x 1 inch wrought iron, to fit down over the top edges of the plank, and made somewhat like a shoemaker's measuring rule with one sliding end to adjust to any thickness of wall, the sliding foot fastened by an iron pin from behind and passing through the horizontal arm, as shown in the annexed figure.

The mould is disengaged after the wall has set sufficiently, by turning off the nuts at the bottom on one side, and lifting up the clamps at the top, the

rods being drawn out of the wall in removing the other side of the mould.

The concrete may be mixed near the building on the ground, or in the building in a rough mortar box of sufficient capacity to hold an extra mould of concrete in advance of that which is being laid upon the wall.

The ingredients for concrete should be sand, gravel, lime, or cement, in the following proportions:

Sand. ....2 parts.
Gravel.....6 "
Lime.....1 "

If cement is used, then proportion in this way:

Sand .....3 parts.
Gravel...6 "
Cement...1 "

There may be substituted for a portion of the gravel large pebbles, pieces of stone, and broken brick. The sand and lime or cement form the cementing substance which binds the mass together, and should be thoroughly worked together with the gravel and stone, as they are thus made to resist greater pressure and wear. Sand should be taken from the pit with only a minimum of loam or earth. The gravel need not generally be screened. Cement is better to mix with than lime, as it produces a concrete of more hydraulic energy, and makes the walls less absorbent of moisture. Limes denominated *poor*, and possessing a proportion of silica and iron, are nearly as good as Roman, Rosendale, or Portland cements.

A much larger proportion of sand and gravel has been employed with the same proportion of lime and cement here designated, giving a wall of medium strength and little hydraulic energy, and requiring a rough-cast outside for protection; 15 to 20 parts sand and gravel, to 1 of cement being the proportions used.

Gravel 8 parts, and lime or cement 1 part, have been used, the proportion of gravel being as high in some cases as 12 parts.

Concrete walls may be constructed easily, with a hollow space by inserting a wooden core 1½ or 2 inches thick in the centre of the wall enclosed by each mould, and removing it with the mould, and thus made to possess all the advantages of a hollow brick wall.

Door and window frames should be set and worked up to as the work progresses. The principal corners of the building should be carried up against a scantling, set plumb, and staylathed in place, and in working up between these on the sides of the building stretch a line for the outside face, and adjust the mould to it as in stone or brick-work. Scaffolding should be erected on the inside of the walls. The partitions should be carried up with the outside walls, and grounds set for the openings.

Bonds should be inserted 1 x 2 inches and 24 inches long, alternated, to receive the interior wooden finish, at the division of each story, beam plates, 2 x 4 or 5 inches, should be laid to receive the beams, and tie anchors should fasten or tie the trimmers and principal beams and walls together. Wall plates for the roof should be anchored in the same manner as in stone or brickwork. Flues may be carried up by inserting a round core with a handle to raise it with the progress of the wall. Breasts may be projected into the room of any width by arching over the fireplace with brick, and topping out above the roof with terra-cotta or brick shafts. If it is designed to have a cellar, footings of concrete must be carried 12 inches below the cellar bottom, and projected 3 inches on each side of the superstructure walls. The trenches should be excavated the exact size and filled with concrete, and the earth back of the foundations taken off 5 or 6 inches to facilitate the use of the moulds, and allow room to set and remove them.

SIDE ELEVATION.

After the walls are completed, and before they are thoroughly dry, if it is desired to give the walls a highly finished appearance, the protrusions of concrete at the junctions of the moulds can be levelled with the trowel, and a thin coat of rough-cast of sharp screened sand three parts and cement one part, plain or colored, can be laid over the surface and floated evenly down. If the walls are to be left plain or without the exterior coat, the protrusions on the surface must be removed, and the floating of the surface carried on as the walls are built up.

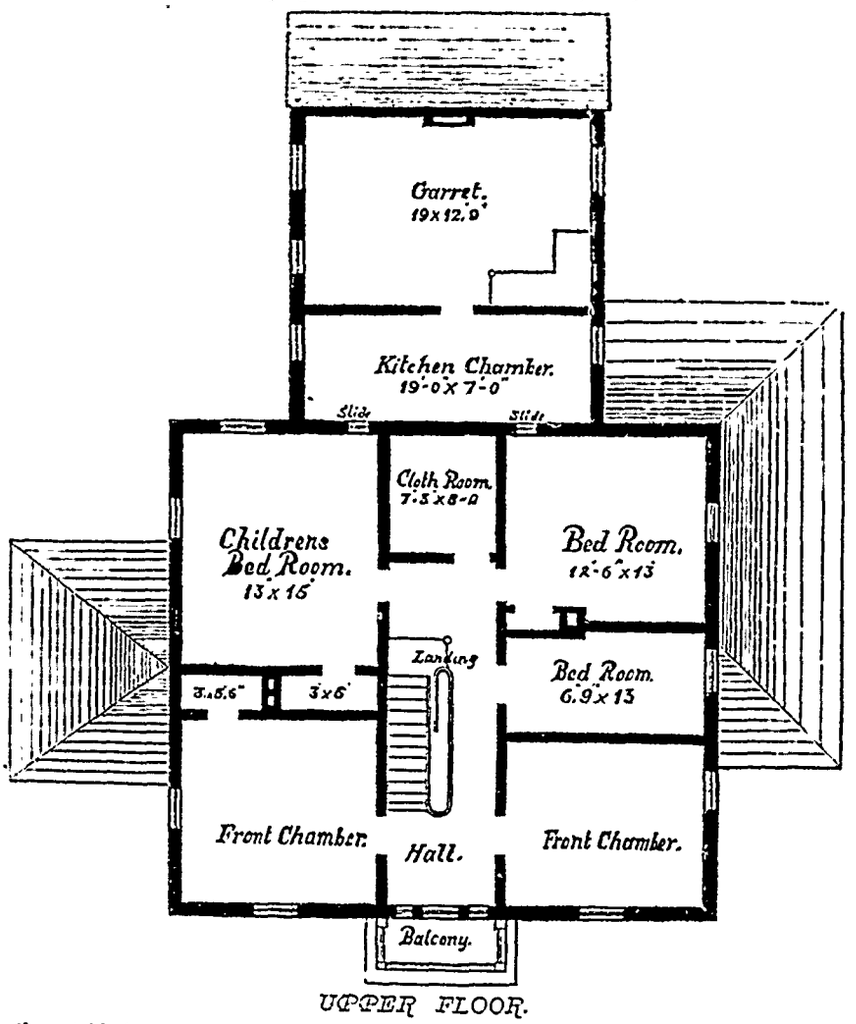
A second mode of building a concrete wall, consists of first grinding the mass of ingredients together with the addition of less than one quarter the quantity of water used for the same bulk in mortar. The grinding is continued until a tough paste is formed, which, placed in the moulds in thin layers and rammed hard, set with rapidity, and become hard as stone. The proportions for this work are as follows:

Pit sand,..... 3 parts.
Slaked lime..... 1 "
Portland cement.. ¼ "

A third mode consists of concrete blocks that may be moulded the thickness of the wall and 24 to 30 inches long, with hollows in the middle of each, or in the form of a common brick, and laid with stretcher and header courses. The ingredients may be the same as for agglomerated concrete, and made in the same proportions. The mass should be mixed or ground together in such a manner that the lime be brought mechanically in contact with the particles of sand, using as little water as possible; and after acquiring the proper consistency it should be placed in moulds and subjected to immense pressure.

A firm in New York city, styled "The American Building Block Company," are manufacturing a concrete block or brick chiefly of lime and sand, of which they speak as follows:

"The Building Blocks are composed of the cheapest known materials—mainly sand and lime—and are made in such form and size, that walls can be constructed from them as cheaply as with good common bricks. "The shape is entirely uniform,



UPPER FLOOR.

with sharp, well defined lines, and they can be made of every variety of shade, from a pure white to a dark brown or stone color.

"These blocks, as now manufactured, are 10 inches long, 5 inches wide, and 4 inches thick, containing 200 cubic inches, and weighing about 12 pounds each; they have an air chamber running through the centre.

"The blocks, from the nature of the material used, and the severe pressure to which they are subjected in process of manufacture, are very durable in their character, as it is a well known and established fact that mortar composition, properly made, is the most enduring of all substances, withstanding exposure for centuries, and constantly growing harder by atmospheric changes, until it becomes a perfect stone.

"These blocks have been subjected to every conceivable test—have been immersed in water until they have absorbed all the moisture which they could hold, and in that condition they have been exposed to severe frosts, and then thawed, and the same process repeated again and again. After being subjected to all the alternations of the atmosphere, the result in all cases has proved the *indestructability of the block*.

"They are composed of such materials, that, so long as the laws of chemistry hold good, time will but make them more durable."

A CHEAP ICE HOUSE.—A writer submits the following plan for a cheap Ice House:—

"For the benefit of those who wish to enjoy a little cool luxury during long, hot summer days, I send you the plan of a cheap Ice House in which I kept ice from February to October, using from it every day after warm weather commenced. Nailed up a pen, 10 by 12 feet, four feet on the ends, seven feet on the sides, leaving the gable ends open—the ground descended about one foot in twelve—filled in saw-dust about six or eight inches deep—sawed the ice as square as possible with a cross-cut saw, and packed it in, leaving a space of a foot on the sides all around. Pounded the cracks between the ice full of fine ice; filled the space around with saw-dust, stamping it down so as to make it close as possible; then covered the whole 12 or 15 inches deep with saw-dust, and put on the roof. After warm weather commenced, I generally went over it once a week to see if there was any melting; if there was, I pounded the place full of saw-dust. This house will hold from 2½ to 3½ tons. If it is allowed to freeze solid, more will be wasted than used. I have tried that plan, but if left as it is packed, you can roll out a block and saw off with a hand-saw as much as is wished."

Another.

A farmer in Seneca Falls writes: "We have kept ice for two seasons past in our waggon-house, taking up the floor in one corner, and making what you might call a large bin, about nine feet square, extending from the ground up to near the chamber floor, but not quite, leaving room for a free circulation of air above the covering of the ice and the floor overhead.

There was slope enough to the bottom for thorough drainage, which is an important matter in my opinion, as well as the open space above. We placed in the bottom about a foot thick of saw-dust and turner's shavings, then some loose boards for the ice to rest upon, and piled it up in the centre, leaving a space all around of fifteen or sixteen inches between the ice and sides of the bin, until we had six two-horse loads in, when we filled in the sides with saw-dust and shavings from the planing mill, tramped it down solid, covered the ice well on top with same material, and had nothing more to do with it until we wanted to get it for use, which was a very easy matter, having of course left a door or opening from the waggon-house into the ice-room."—*Maryland Farmer.*

MILK CELLAR.—A milk cellar will be coolest when well sunk in the earth, and not much above its surface. Eight feet would be a good depth. The windows, near the top of the walls, should be protected from the sun, either by trees or shrubs, or with blinds or shades; and wire screens inside should be made to exclude all insects. Covering the bottom with hydraulic cement is not a good conductor of heat, it will render the cellar warmer in summer and cooler in winter, by preventing access to the earth. Good stone flagging would be better in this respect, and hard burned brick would be better than common brick. There should be a ventilating flue run up from the upper part of the apartment, in which the current of air may be regulated by means of a register.—*Country Gentleman.*

Horticulture.

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

THE ORCHARD.

SHOULD ORCHARDS BE CULTIVATED.

Quite a discussion has lately arisen on the question whether it is better to cultivate, that is, plough and harrow the ground in our orchards, or to seed them down and let the ground lie undisturbed. As experiment alone can satisfactorily solve the problem, fruit growers have been requested to give the result of their experience, throwing light upon the subject. Responding to this request, a correspondent of a co-temporary writes thus:—

"I have several orchards about fifteen or twenty years old, that have always been kept in sod, and received no other attention than a slight pruning every two or three years, and an occasional load of manure or ashes as a top-dressing. As a consequence, we never had a bushel of *perfect* fruit up to the year 1870. The trees bore pretty good crops, but the fruit was small, wormy at the core, and knotty, while the trees themselves looked very badly. The soil in all of them is a black gravelly loam; the trees consist principally of Bellefleurs, Smokehouse, Green Pippins and Romanites. In the fall of 1870, I ploughed the ground in one orchard, containing about thirty trees, to a depth of five inches, gave it a good dressing of manure, and trimmed the trees carefully. Since that time I have kept the ground cultivated and the trees carefully trimmed and *scraped*, and each year have noticed a marked improvement in both trees and fruit until this fall, when I had the satisfaction of sending to market the finest lot of Bellefleur and Smokehouse apples ever seen in this section, and which I readily sold at $1.25 per bushel, while apples were selling all through our streets at from 30 to 70 cents. The fruit was large, rich flavored and high colored, while from the trees growing in sod I did not get ten bushels of first class apples. This I think proves very clearly the importance of cultivating the ground and scraping the trees regularly and carefully, as by so doing we can most effectually destroy the harbor of all the insects injurious to the apple, besides giving the trunk and limbs a healthy, smooth bark, under which the sap can flow freely in sufficient quantities to ripen perfect fruit."

Now the experiment in this case throws no light on the question at issue. The orchard had simply been neglected, had only an occasional load of ashes or manure and a slight pruning once in two or three years. Before the question can be fairly tested, the orchard should have all the manuring, scraping and pruning which it requires without ploughing or disturbing the soil. After having taken care of it in this way for a number of years and results noted, then the ground might be ploughed, harrowed and cultivated every year for a like length of time, and if any difference were noticed it might with some show of reasoning be attributable to the stirring of the soil. But that the products of an orchard which has been manured, pruned, scraped and cared for, should be better in quality and quantity than of one that was not systematically cared for, with or without stirring the soil, was a result most certainly to be expected.

Our advice is not to seed down an orchard of young, growing trees, but to stir the soil with the plough and cultivator, until the trees have attained nearly their full size, then the orchard may be seeded down and the growth allowed to remain and decay on the ground, not cut and carried away. At the same time, the trees should receive such supply of manures, ashes, &c., as will keep them in good healthy condition, with a regular annual washing of the bark with a solution of potash or week ley, and pruning as may be needed. We believe that when the trees have become large and the roots have filled the ground, it is better not to use the plough in the orchard; but to keep up its vigor and productiveness by taking nothing away from the soil except the apples, and applying to the surface such fertilizers as may be needed. The trouble is that when the orchard has been seeded down, all care and attention cease, pruning is done by fits, no fertilizers are applied, or if at all, without any regularity, and the whole thing is left to take care of itself. Better by far to plough up the orchard every year and take care of it, if you cannot take care of it without ploughing.

CLEARING MOSS FROM FRUIT TREES.

The American Agriculturist says nothing is better than carbolic soap and lye. Make common lye of wood ashes, not strong, and add half a pound of carbolic soap to a three-gallon pail of boiling lye. Apply hot with a swab to old trees. It has been used with entire success on apple, pear, peach and cherry trees, destroying every particle of moss it touches.

SHELTER BELTS FOR ORCHARDS.

Mr. F. R. Elliott, of Ohio, writing to the Cleveland *Herald* says that the benefit derived from the planting of Evergreen trees for shelter is due to the fact that a well grown evergreen gives off continual warmth and moisture, the influence of which extends only to a distance from the tree equal to its height. Hence he argues that belts of evergreens on the north and west of large orchards of fifty or more acres fail of their object, and that to assist in preventing injury from extreme cold in winter, and from the frosting of the germ bud of the fruit in spring, all orchards should have evergreen trees planted in and among them at distances of not more than one hundred and fifty feet apart.

While we think that much of the benefit of good belts of evergreens is due to the fact that they break the force of strong, frost-laden winds, and therefore do not believe that they will eventually prove to be of *no value*, but on the contrary that they will be of great value when once they have attained sufficient height and strength to arrest the sweep of the wind; yet we do believe that Mr Elliott is calling attention to an ameliorating effect which these trees produce upon the surrounding atmosphere, the full benefit of which can be secured only by planting them, as he suggests, at intervals through the orchard. How he has ascertained that this influence extends only to the distance of a circle around the evergreen, the radius of which is equal to the height of the tree, he has not told us. An account of the experiments by which he has been led to these conclusions would be exceedingly interesting and instructive.

TO MAKE PEAR TREES FRUIT.

Many persons complain that Pear-trees are so slow in coming into bearing, and indeed this experience has found expression in the proverb "Plant pears for your heirs." This is not true of all varieties, however, as everyone knows who has cultivated the Bartlett pear, for example. Mr. D. W. Coit says that refractory sorts, such as the Dix and Urbaniste, can be brought into bearing early by securing, at first, a good healthy growth of well ripened wood, by means of thorough cultivation, and then after the tree has attained to a suitable size, any branch may be thrown into bearing by cutting it back during the early part of summer This will make the eyes that are left form rosettes, throwing out four or five leaves. Sometimes these become blossom buds and fruit the next season, but at the farthest are certain to blossom the third year.

Our friends who are anxious to see the fruit of their pear-trees can try this method, which Mr. Coit commends, especially to those gentlemen who are raising seedling pears and wish to know the result of their labors as speedily as possible.

THE BALDWIN APPLE.

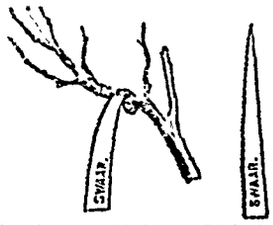
This variety has been reported to be too tender to endure the climate of our colder latitutes, yet the following paragraph from the *Maine Farmer* seems to indicate that the tree is both hardy and profitable in some parts of that cold state: "I raise many kinds of grafted apples, perhaps nearly all the most noted kinds raised in Maine, and among all the winter varieties the Baldwin stands at the head, with me. The tree is hardy and prolific; the apple fair and handsome, and of the right size; fine grained and solid, the heaviest apple that I have ever known according to its bulk; the quality good for either eating or cooking, and when you carry them to market, no buyer objects to No. 1 Baldwins. I can get more dollars from a Baldwin tree than from any other kind."

The facts are these: The Baldwin is a first-class apple, it is raised in Maine in great abundance, and no other variety, as yet, takes the precedence. There are thousand upon thousands of nice Baldwin trees in this State, which I venture to say, are as hardy or nearly so as any other variety. And there are thousands of barrels of this deservedly popular fruit shipped from this State in years when apples are plenty. So, too, the demand for Maine Baldwins is on the increase, each succeeding year bringing some new customer to our doors.

REGISTERING AND LABELING

The *Country Gentleman*, very timely suggests that cheap, durable labels for fruit trees can be made of strips of tin, half an inch or more in width at one end and tapering nearly to a point at the other. The name is scratched on the broader end by means of an

awl, point of a file, or other hard point, so as to cut through the tin-coat into the iron. The name thus written becomes rusted where the point passes through, and renders the letters distinctly visible. The narrow end is passed once or twice around a branch, and holds the label, yielding as the tree grows. The accompanying cut explains the appearance and mode of using this kind of label.



THE GREENHOUSE.

We commend the following from the Iowa *Homestead*, to those of our readers who would like to have a small greenhouse:—

I began my little house by excavating a pit three feet deep, ten feet wide and thirty-five feet long, running north and south. The glass structure is thirty feet long, formed of twenty sashes six feet four inches long by three feet wide, made from two inch stuff, with 8x10 glass. The sashes were made thus strong so as to bear up their own weight, no rafters being used to support them. Around the sides of the pit were set up pieces of 2x4 scantling four feet high, with a bevelled plate on top, to which the lower ends of the sashes were screwed, except every third one, that being hinged to the ridge pole, to tilt up for ventilation when the weather becomes too warm. The sides and ends were boarded with common rough lumber, thus to keep the earth from caving in. As the sides extended a foot above the level ground, earth was banked up sloping as high as the eaves.

The sashes rest on a shoulder let into the ridge pole at a proper angle. At the entrance (south end) is a glass door, a triangular sash on each side filling up the corners. All possible light should be let in, from every direction. Two benches, each three feet six inches wide, run along the sides, with a three-foot walk through the centre. The benches might be four feet wide, and the walk contracted to two feet; but a reach across a four-foot bench, to a short person with a short arm, is too much. A rough shed is attached to the rear, for storing coal, potting earth and tools.

The heating is done by a brick furnace, with a flue made of eight-inch cement drain-pipe, running under the bench on the west side. This pipe is better than the ordinary brick flue, as the joints can be made tighter, and they will not leak smoke and coal gas, so injurious to plant life. Having the pipe recommended, and not knowing just how to use it, I committed an error in putting it too close to the furnace; the consequence was that when firing hard during cold nights to keep up the necessary temperature, the joints cracked within eight feet of the furnace. This defect was remedied by letting the pipes remain in place and building a brick flue right over and around them, with bricks set up edgeways. Would not advise putting this cement pipe any nearer than fifteen feet of the furnace.

Two inches of sand are placed on the benches, and on this the plants are set. This sand is daily sprinkled with water, as also the walk to maintain proper moisture. Pans of water are placed on the furnace and pipes, a constant evaporation being thus kept up. This moist atmosphere is necessary to keep down the minute red spider. Green lice are kept in check by smoking with tobacco. Every week a small fire of shavings is made on the floor, and dampened tobacco stems thrown over, which soon fills the whole house with a dense, stifling smoke. The door is closed tight, and left so all night.

The grate bars are one foot wide and thirty inches long, and the furnace twelve inches high inside. This gives a large heating surface, sufficient to maintain any desired temperature. I had almost forgotten to state the cost of the work on this little green-house, which was $235 all told. The labor was all done by hired hands, at a time of year when mechanics were busy, and a carpenter could hardly be had for love or money. Any man handy with tools, and who could paint and glaze the sash himself, might put it up at an expense of probably $50 less than the above amount.

Having the flue under but one bench, of course one end of the house is warmer than the other, and a temperature suited to a varied collection of plants can be maintained, there being a difference of ten to fifteen degrees between each end. Plants requiring the most heat are placed nearest the furnace, while those of a cooler nature take the cold end. The amateur grower must learn thus to discriminate between plants needing different degrees of heat, for this is why so many fail in growing house plants to perfection, with a miscellaneous collection; for while some would be growing luxuriantly, others would be burned up.

A greenhouse full of plants—(mine isn't yet)—how many look upon it as a pleasant and beautiful place, yet imagine it an expensive luxury, difficult to manage, and only to be thought of by the wealthy, with a hired gardener to take care of it; while it does not cost as much as many suppose, and there is not a woman, girl or youth, with a natural love of flowers, who could not soon learn the art of propagation from cuttings and growing from seeds, and how to manage a small plant-house.

Aquilegia Cœrulea.

Perfectly hardy border plants are always desirable, and the more especially when they combine this very important quality with those of gracefulness and beauty. The variety to which we now call the attention of our readers was introduced to the lovers of the beautiful, some years ago, and having been fully tested since then, we feel warranted in recommending it as well worthy of a place in every Canadian flower garden. It is found growing wild on the sides of the Rocky Mountains, and fully maintains the hardy character that might be expected of it. The flowers are very beautiful from the contrast

between the pure white petals, and the clear deep blue of the outer sepals which surround them. A very good idea of the form and appearance of the flower will be obtained by examining the accompanying engraving which our artist has executed with great truthfulness. The plant is a most profuse bloomer, and when covered with its blue and white flowers forms a very attractive object, and may well be ranked among the very finest of all our beautiful herbaceous plants. We presume it can be obtained of all our leading nurserymen.

Among hardy perennial plants, the above may be ranked as one of the finest. It has been pronounced to be not only the queen of columbines, but even the most beautiful of all herbaceous plants. The flowers measure from 3 to 3½ inches in diameter. The outer five petals as well as the long spurs are of a beautiful violet blue. The inner petals are pure white, forming a pleasing contrast. The plant being perfectly hardy, and remaining a long time in bloom, renders it quite an acquisition to our rather meagre list of hardy herbaceous plants.

Its cultivation is quite simple. The seed can be sown in the spring *in* a frame, box or open border, and afterwards transplanted wherever it may be desired, to remain in the open borders. A slight covering of straw or litter may be thrown over the plants for protection during the winter, and the following spring the cultivator will be amply repaid by the profusion and beauty of its blooms.

THE KITCHEN GARDEN.

EARLY TOMATO PLANTS.

A correspondent of the *Rural New-Yorker*, says: I took a small box, 12x20 inches, 6 inches deep, and filled it with good garden soil and set in on the kitchen stove-drum, and let it sit there till the earth was thoroughly warmed; then took a stick and made marks an inch apart, 4½ inches deep in the earth, cross-ways of the box; then scattered tomato seeds quite thick along the rows and covered them about ½ of an inch deep; then took a newspaper and wet it and covered the box to prevent the earth from getting dry on top. The box was set on a bench near the stove after the seeds were sown and the following day set on the stove drum again, for the purpose of keeping up the heat in the soil, being careful not to let it get too hot. In 48 hours from the time the seed was sown, they had sprouted and many had broken the ground, a few were near ½ inch high. When the plants had attained to the height of two inches I transplanted them into other boxes about 1½ inches apart each way. The plants were left in these boxes till they had attained a height of four inches and then transplanted into a sort of hot bed made as follows: A pit was dug in the side of a hill facing the south-east, six feet wide by twelve feet long, and posts driven in the ground at the corners and one on each side 6 feet from either end. On these posts, boards were nailed two feet high in front and 2½ feet high at the back, giving 6 inches fall from back to front. In this frame I put fresh horse manure, mixed with litter, such as is found at farmer's horse-stables, to the depth of 12 inches, pressing it down firmly as I put it in; then put on 6 inches of good soil and covered the bed with covers, made by stretching and nailing with 10-oz. tacks, common heavy brown muslin on light frames 3 x 6 feet. These frames were made of white pine lath, sawed 1 x 3 inches, halved at the corners and nailed with clinch nails. Common cut nails heated to near a white heat and allowed to cool very slow, are just as good as the clinch nails sold at the hardware stores and are much cheaper.

After the covers were put on, a board was laid across the upper ends of them, reaching from one end of the hot-bed frame to the other; and also across the lower ends, to prevent heavy winds from moving them. As soon as the soil in the bed was sufficiently warmed I raked it down smooth and marked it in rows 4½ inches apart and set the plants the same distance apart in the rows.

Before removing the plants from the boxes, the soil was thoroughly wet in order to cause as much soil as possible to stick to the roots; then a case-knife was drawn through the soil, midway between the plants each way, about four inches deep, and in removing the plants no difficulty was experienced in keeping the dirt about their roots. After being transplanted and the covers put on, no care whatever was given them except an occasional watering.

About the 20th of May, the plants were removed to the open ground, the same care being exercised as regarded watering and cutting between the rows, that had been when transplanted to the hot-bed. These plants were as fine as any I ever saw grown anywhere, except those grown in a green-house in pots. Tomato plants must have *age* in order to produce early tomatoes.

THE HUBBARD SQUASH.

As the time is at hand when our readers will be providing themselves with seeds for the kitchen garden, we give them the opinion of an Iowa correspondent concerning this very fine flavored vegetable. He says. Though desirable as this excellent vegetable is, yet it is often not appreciated, on account of not being pure, as it is very liable to mix if planted "within gun shot" of anything else in the line of pumpkins, melons or squashes. Use pure seed, keep them unmixed, and gather before frost, and they justly deserve the first place on the table, next to the potato, during the scarcity of green things in winter, as it is emphatically a winter squash, keeping sometimes as late as April.

THE VINEYARD.

Rogers' Hybrid Grapes.

Some of the sorts known as Rogers' Hybrids have proved to be so hardy at Toronto and northward that we give our readers the experience of a correspondent of the *Prairie Farmer* who seems to be surrounded with difficulties, similar to those with which many of our planters have to contend.

He says that three years ago last spring he planted one hundred each of Rogers' No. 4 (Wilder), No. 15. (Agawam), and No. 19 (Merrimack), that they all made strong, healthy vines, and fruited the past season, yielding nearly as abundantly as Concords at the same age. With the Salem (No. 22) he has not been as successful, for of two hundred planted four years ago last spring he has only some two dozen left. The lower roots died, and a feeble growth was maintained by the surface roots, so feeble that he dug the plants up and replaced with more vigorous sorts. He has had the same experience with his Delaware and Iona vines.

But he has had good success with even these sorts, (and here is a point worthy of being noted and experimented upon), by grafting them on the stock of other vines that do thrive well in his soil. The most of those thus grafted by him bore fruit the past season, and of better quality than any he had obtained from the vines growing on their own roots, and the leaves hung on until frost.

Perhaps here is a hint that may be turned to good account. The Clinton is a very hardy, strong growing grape-vine, and it may be that some of those varieties that seem to grow feebly in certain soils, might be found to thrive well and yield abundant fruit if grafted on the Clinton. The Delaware usually fails on strong clayey soil, but by first planting the Clinton and after it has become established grafting it with the Delaware, it might be that fine Delawares could be then grown. Will not some one who has not been able to grow the Delaware try the experiment and report results to THE CANADA FARMER.

Sulphur for Grapevines.

An inquiry in Australia as to the use of sulphur on grape-vines for curing the Oidium, brought out the following responses from correspondents, which will interest and instruct Canadian grape-growers.

"For the information of those interested in vine-growing, I would state that sulphuring is the best known remedy against the Oidium Tuckeri (vine disease). I use three parts wood ashes, two of sulphur, and one of lime, mixed together, and find that it answers remarkably well. This mixture is laid on with a sulphuring bellows, as follows: The first time is done now, after close pruning; the second time just before the buds burst; the third time when the blossoming is over, or nearly so; the fourth time when the fruit is about the size of a pea; the fifth time when the fruit is about half grown; the sixth and last time when the fruit is about ripening. Whenever a shower of rain has washed off the mixture, the sulphuring must be repeated.

This is my experience, and I am satisfied with the result.—C. F. GERLER."

"In response to the request for information concerning the best means to prevent the Oidium, or grapevine disease, I have to state that last year I used sulphur and ashes on part of the vineyard; on the other part, lime slaked with strong brine. Where I used the lime was on the part of the vineyard that was the worst affected with the Oidium. The difference is plain to any one. The canes are bright and clean, where, before using lime, the tops were rotten half way down. This year I shall use lime and brine over the whole of the vineyard. The mixture should be used as soon as the buds begin to open, and not sparingly.—W. S."

"I give you my experience as a practical gardener, and my management of vines:—When I have done with the pruning, I scrape all the old bark off with a scraper, and clear away the earth from the vines, not to disturb the surface roots. I then paint the vines all over with my own compound, viz., steep 1 lb. of tobacco in 3 quarts of hot water, to extract the juice, strain off the juice; cut down 3 lbs. of soap very small; put the tobacco juice and soap into a pot, and put it on a slow fire to melt the soap; when it is melted, add ½ lb. hellebore, and 2 lbs. sulphur. Stir the mixture well; then empty it into a small box. It will keep for any length of time. To use this mixture, dissolve about ½ lb. in water to the thickness of paint, and with a paint brush paint the vines all over. It will remain on the vines for twelve months, and is a perfect cure.—WILLIAM DAVIDSON."

What Pears shall I Grow.

An excellent address was recently delivered at the Western New York Fruit-growers' Association, by Mr. F. R. Elliott, of Ohio. The following extracts from it will be useful to many of our readers as showing the views of a man of great talent and experience among our neighbors on a highly important subject. Mr. Elliott said:

It is pretty well known that for over twenty years the Pear has been one of my hobbies in the fruit line, and during the past three months I have had hundreds of applications for an answer to the question, "what are the most profitable as well as good varieties of pears to plant, looking forward to only good ordinary care in cultivating?" At this present time there are probably over 1000 varieties of pears named and described. I have myself notes and observations of over eight hundred, either fruited by myself or examined specimens grown by my friends.

Ere we commence our list, let us say that the grower of trees for sale, and the dealer, are just as much interested in their character for vitality, vigorous growth and productiveness as is the permanent planter. They are immediately benefited in the value of this crop, when it is known, both to be a rapid healthy grower, and productive of valuable, saleable sized fruit. We shall not attempt against our own conviction of quality, to touch the richness of *Rostiezer* as compared with the saleable value of *Windsor*, known commonly as *Summer Bell*; but, in our short condensed list of values, shall look, and we hope our readers will so understand us, to the growth of the tree being healthy and vigorous, productive of large, handsome, well formed fruit of *good* quality.

In our American list of native pears we have among our earliest ripening sorts, of large size and fine form, good quality, healthy tree, etc., one under name of "*Clapp's Favorite.*" It has New England for its origin to favor it, but almost everywhere else that we read of its growth and product, it partakes of a tendency early to decay at the core, and so, like the fine gold of Summer, Kirtland, Muskingum, Zoar Beauty, etc., is, and will prove, only of value to the amateur. A market sort must have a permanency of ripening, otherwise it is too often either a loss to the producer by its decay in transportation, or to the dealer by its too rapid decay on his hands ere sold. These points in regard to pears therefore are leading items that must be studied when the profits of planting or growing and sales are regarded; and at the same time they are equally of value to the amateur, because if he have but one tree and its fruit be a long time and irregular in ripening, he is the gainer.

Wharton's Early

Is a pear of which the origin has never yet, to our knowledge, been learned; but it was freely distributed in sections of Ohio over thirty years since; but never having come into the hands of any pushing tree-grower, is yet little known, and possibly it deserves no more, but, from what we have seen of its fruit, its habit of growth, productiveness, early maturity, etc., we feel like calling the attention of pear-growers to it. We are not prepared to say that it is the pear desired for early ripening, but its size is equal to Clapp's Favorite, and so far as we have knowledge of it, it matures earlier, and does not readily decay.

Windsor.

An old variety, commonly known as Summer Bell, unquestionably has, and will continue to have for years to come, a profitable market value second to none—not even Bartlett—but it is a variety that no man ever desires for his own family use, because once he or his children have the least acquaintance with knowledge relative to the constituents of a good pear, it will not even be used for cooking in his own house, and his children will turn to any poor early apple in preference. We put this old worthless but money profitable pear in our record here, because it has numerous statements on record relative to its profit, i. e., "one tree having given over sixty dollars a year annual returns from sale of its fruit." "Ten trees have paid me more from the sale of its fruit than the best acre of apple orchard on my place." These, and many more items like unto them, are or could be quoted; not that they add one item to the point we now wish to advocate, but they are and may be made antagonistic to our desire, that however much of money profit there may be in growing it—there can be no honor in offering it for sale—beyond that of the counterfeiter who offers you $100 of his product for $10 of really good coin.

Brandywine.

This pear has a high reputation in its own native State of Pennsylvania, and will be found in a large number of lists recommended by fancy amateur growers in southern central latitudes, but when the actual character of it comes, and its profitable marketable sales are compared with Bartlett, there is no use in adding it to your list.

Bartlett.

Of this it does not become me more than to name it, and concede the fact that however it may be deficient in richness, delicacy, etc., its size, its musky aroma, etc., together with the good growth, healthiness, and early abundant prolificness of the trees, the fact that it may be picked green—packed in an air-tight railway car, and conveyed hundreds of miles, and turned out to buyers in the best possible eatable and showy condition, and command a fair price—is all that is needed. And yet we feel like saying to future pear-growers, the following few words, viz: There is more money and more home enjoyment—*i. e.* good pears for mouths of the home family—in growing later ripening and better qualities.

Ananas d'Ete.

This old variety is but little known, yet its fruit with us for twenty years was large, handsome, and in pomological sense, very good. This past season, it has been extra fine, and from the fact that the tree is a vigorous healthy grower, productive of fruit along with, or immediately following Bartlett, there seems no good reason why it should be neglected. It succeeds on Quince or pear stock.

Louise Bonne de Jersey.

As a grower on quince stocks, as an early bearer of fine and fair fruit, as a tree of easy training, as a pear of beauty, when even decently treated in its growth, as a variety that even on the quince, as a dwarf, seems to succeed on sandy, loamy, or clayey soils, we have perhaps no equal to this variety. It has been fully and fairly tried over a quarter of a century, and while our good and capable enthusiastic fruit-grower of Lyons, N. Y., Dr. Sylvester, sets its record at over $600 per year of productive sales, and while we have almost everywhere good record of it, we feel a little disposed to say to planters, do not go too strongly into it; and simply because, that while it is productive, etc., it comes in just with our late fall peaches and best autumn apples, and therefore commands only as a rule (see Dr. Sylvester) a nominal price. It is, however, one of our standard list of varieties of pears to be grown as dwarfs.

Onondaga, or Swan's Orange.

This is another among the most vigorous healthy growers, and early productive, whether on quince or pear stock. In season, again, it comes opportunely just after the Louise Bonne de Jersey, and as a fill up with Flemish Beauty, etc., We cannot commend this variety too strongly, and yet in so saying don't take us as giving it preference over all others, we only want you who read our observations to know that it is one of the large sized pears, of really good quality, looks much like Bartlett, and will sell readily, because like Bartlett its unripe picked fruit will color and ripen up gradually in the dealer's or consumer's hands.

Whieldon.

Or, as first sent out under name of McLellan, is one of the moderately regular formed growing trees, a profuse and early bearer of a good fair above medium sized fruit, well formed, rich in color, and nearly first best in quality, coming in to maturity and market about the last of September, or as compared with Bartlett one month later. We have kept its fruit three weeks, roughly handled in a carpet travelling sack, and advise all pear-growers to look after it as a variety, and try from five to ten trees of it. As a dwarf or standard, toward the success of its culture we know nothing.

Mr Elliott went on to enumerate further among the Pears he recommended the following varieties:—St. Crispin, Flemish Beauty, Lorlot de Barney, Duchesse Precoce, Depierre, Doyenne Boussock, The Lawrence, Howell, Beurre Clairgeau, Compte de Flandre, Beurre Diel, Beurre D'Anjou, Duchesse D'Angouleme, Beurre Bosc, White Doyenne, Goodale, Maria Louise, D'Uccle, Marechal de la Cour, Josephine de Malines, Winter Nelis, Vicar of Winkfield, Louise Vilmorin, Therese Appert, Saint Therese and Belle Epine Dumas.

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The Canada Farmer.

TORONTO, CANADA, FEBRUARY 15, 1873

☞ It was well on in January before the new series of THE CANADA FARMER was determined upon—and the editorial and mechanical arrangements for its publication occupied some further time. The first numbers have, in consequence, appeared behind time; but we shall presently make up the lost space, and appear punctually on our stated days of publication.

☞ Having found sixteen pages of reading matter in each number of THE CANADA FARMER inadequate to our purpose, we have enlarged the number of pages to twenty.

IMPORTANT ADDITION TO OUR STAFF.

We have the pleasure of announcing that we have secured the services of Mr L. B. Arnold, Secretary of the American Dairymen's Association, as Editor of the Dairy Department, of THE CANADA FARMER. Mr. Arnold has no superior and probably but one equal in eminent qualification for the position. He is an able, shrewd, matter-of-fact man; has had great experience as a practical farmer; is thoroughly conversant with the rise, progress and present condition of the cheese and butter factory systems on this continent, and with the whole details of factory organization and operation; and in writing or speaking on these subjects he goes direct to the marrow of the question without flourish or circumlocution. We confess our hearty gratification at this addition to our Editorial Staff. We look forward to a large extension of dairy farming throughout the Dominion, and a great improvement in the quality of our dairy products, as the surest and easiest mode of renovating our exhausted lands and enhancing the profits of agricultural industry, and we are persuaded that, in this march of improvement, no more experienced or safer guide could be desired by the farmers of Canada than Mr. Arnold.

Our arrangement with Mr. Arnold provides for a continuous series of articles during the present year, explaining clearly and systematically the buildings, machinery and capital requisite for a cheese factory—the mode of organizing and managing factory associations—the most approved methods of making, curing, packing, shipping and selling cheese—and the most profitable modes of managing dairy cows. It also provides for a similar series of articles (to be published simultaneously) in regard to butter factories and creameries. The whole of these articles to be amply illustrated by wood-cuts in the best style of the wood-engraver's art available to us.

We have not a doubt that these articles from Mr. Arnold's pen will alone be well worth the entire annual subscription of the CANADA FARMER to all our agricultural readers.

THE SOILING SYSTEM.

How comes it, inquires a western cotemporary, that though the advantages of the soiling system have been thoroughly discussed for many years and shown by theory and practice to be great and undoubted—its practical adoption in the management of our farms has not become universal?

We doubt if there is one intelligent, enterprising farmer who has tried the soiling system, either partially or in whole, who has not many times put to himself the question suggested by our cotemporary. The admitted difficulties in the way of its adoption are no doubt considerable; but they are not so serious as to account for the apathy shown in regard to so great a reform. Thousands of the agriculturists of Canada could adopt the system as the basis of their farm operations without much inconvenience; all of them could adopt it in part without any inconvenience whatever; and the gains from it are so direct, so palpable, so immense, as to sweep away all objections and leave only wonder that soiling is not the universal rule.

Nobody denies that when the heat of summer arrives, as a general rule in Canada pastures become bare, cattle are sorely pinched, milk decreases, young stock become stinted in growth; and that green crops, specially sown to be cut and fed through these weeks of parching drouth, *do* avert all this loss. And yet, how few adopt even this small *modicum* of the soiling system.

No intelligent farmer doubts for one moment that the more cattle well kept on a farm, the more manure will be made; that the more manure made, the larger and better will be the grain crops; that, in fact, the profits of farming in Canada hinge on this pivot—and that by even a partial adoption of the soiling system, the number of cattle kept on every farm in the land might be greatly increased and the manure vastly augmented. But, yet, how very few farmers even partially adopt it.

Nobody denies that a vastly larger amount of good cattle fodder can be got from an average acre of green crop, to be cut and carried to the animals, than can be raised on an average acre of ordinary pasture; and that even of this inferior bulk of pasture grass, the cattle by trampling down and by droppings, destroy at least two-thirds, while the whole of the green crop is saved and eaten. But yet how few farmers have practically tested the relative cost of the two systems, with the fixed determination to adopt the one found most profitable.

No farmer who has considered the subject doubts that even on well managed dairy farms under the pasture system in Canada and the United States, it requires the produce of from three and a half to five acres of land for the support of a full grown cow or steer for one year And yet it is easily demonstrable by every farmer in Canada who likes to try the experiment through the coming six months, that *three* full grown cows or steers can be better fed and maintained in better health and condition on the same space of land by raising green crops and feeding in stables or yards.

We know it is objected that soiling involves a great deal of manual labor—and doubtless the labor is greater than in pasturing, but the cash returns far more than compensate it:—That buildings are required specially adapted to it—but this, though expedient where a large herd is kept, is not imperative.—That the animals are cramped and injured by confinement—but this is not so; and if it were, they need not be housed in summer, but fed with cut food in a yard or "bush:"—That it is an unnatural system and destructive of health to keep beasts in stables,—but the very contrary is the fact.

We entertain not a shadow of a doubt that whether applied to the management of dairy stock, or cattle intended for the butcher, or thorough-bred stock for breeding purposes, the soiling system is incomparably the best and most profitable. We are satisfied—

That it saves land—

That it saves internal fencing—

That it economizes food—

That it keeps cattle in greater comfort and higher condition—

That it produces more milk—and

That it enhances immensely the quantity and quality of the manure.

In a system of soiling adapted to Canada, RYE sown at intervals during September and October, and pushed on so as to be ready for cutting in May, will naturally be the first crop. Green Rye is a first-rate fodder crop; and properly treated gives fifteen tons to the acre. One acre of it will maintain well twelve cows for an entire month—or in the proportion of one cow for an entire year. *The same land on which green Rye is thus grown*, can be easily got ready for a second crop—say of Western Corn, drilled in. The weight of green Corn stalks to be obtained in this manner from an acre, depends on the character and condition of the soil, the character of the season and the promptitude with which the seed is got in after removing the Rye. It is best to hurry in the corn seed, from day to day, as fast as the Rye is cut. Under favorable circumstances, 20 tons of green Corn stalks to the acre may be expected; 15 tons to the acre is a poor crop. Last year (1872) 21 acres of Western Corn, sown as above after Rye, so late as the beginning of August, yielded an average of 18 tons to the acre of splendid forage. Now let any one compare the profit from an acre of land yielding 15 tons of rye and 18 tons of corn stalks in one season, with the profit from the same acre devoted to pasture, and he will see that the cost of planting, reaping and feeding the two green crops is as nothing in comparison with the direct cash gains from that system.

The crop that usually follows rye in Canadian soiling is common *red clover*. With a good dose of gypsum at the first blush of spring, clover is ready for cutting in June, but it is wise to cut as little of it as possible, and to save it for hay. A good crop of ripe green clover, on suitable land in good condition, weighs from 10 to 11 tons per acre, according to the season, from the first cutting; a second cutting, equally good, can usually be got; and even a third crop may sometimes be taken if deemed expedient.

Close after clover should come Oats, sown thickly very early in spring, or oats and tares, or better still, oats, peas and tares sown together. The green forage obtained from either of these crops is succulent and delicious, and the weight in favorable seasons, enormous. Even in 1871 and 1872 good crops were obtained by early sowing and thereby getting the land screened from the hot rays of the sun. We have never known the produce of an acre of this crop to be weighed, and therefore speak with reserve as to it, but we should deem twelve tons per acre a poor crop, and from twenty to twenty-five tons a good one.

But the grand soiling crop for Western Canada is Ohio corn drilled in. No crop is so ravenous of manure as Indian corn, but give it plenty of that, and keep the weeds down, and no other crop will yield the cash returns that it will. Let the season be what it may, the corn stalks will be a profitable crop; and in a good season, properly cured, and properly saved and cut for winter use, there is nothing to compare with it as an abundant and profitable forage crop. Early put in and rightly cultivated, twenty-five tons per acre of green Ohio corn-stalks is a poor crop, and thirty-five tons is a good one.

The fact is, there are not two sides to this question. The soiling system has but to be fairly tested, to make the candid experimenter, an enthusiastic advocate of its surpassing merits. Our space is exhausted for this number, but we shall have much to say hereafter on this subject.

COBOURG FARMER'S CLUB.

Dairy Farming.

A meeting of the township of Hamilton Farmer's Club was recently held at Cobourg, Mr John Pratt, President, in the chair. The subject for discussion was "Cheese making as a branch of Canadian Farming," which was introduced by Mr Henry Wade He said it was only about ten years since the first introduction into Canada of the Cheese-Factory system. Up to 1862 we imported more than we exported. We imported as high as 2,530,950 lbs of cheese in 1861 The great change which has since taken place will at once be seen by the following returns of the exports and imports of Cheese during the last two years:

	IMPORTS.	EXPORTS.
1869-70	59,494 lbs.	3 827,782 lbs.
1870-71	69 4,0 lbs.	8,271,439 lbs.

These figures indicate a complete revolution in this branch of Canadian farming, as up to that time we did not produce enough for home consumption; now taking the difference between the imports of 1870-71, and the exports we have 8,201,984 lbs, representing in money value $820,198, besides the enormous quantity used at home. The home demand is steadily increasing every year, as cheese is much more generally used for food than formerly It was formerly used more for a relish, but now it is largely substituted for meat. A pound of cheese containing more nutriment than one pound of meat, while the relative value per pound is about the same. Assuming no waste, a pound of meat may make a pound of flesh; but a pound of cheese, by absorbing water, will furnish material for more than one pound of flesh. It is, therefore, a very good substitute for flesh, leaving the matter of taste out of question. Before cheese became an article of export, farmers in this grain growing locality, I am sorry to say, were (and unfortunately still are) in the habit of depending almost entirely on raising the cereals. With but limited means, and unable to give the land that amount of working which is necessary, and without stock sufficient to provide manure, it is no wonder that our lands have deteriorated. All of us can remember how some years ago, what with dry weather, and the midge, it was hardly possible to grow a crop of wheat worth harvesting; Then we took to raising barley as a substitute; and now, as a natural result, in many of our fields we can hardly tell which is master, barley, thistles, or charlak. The only cure for this that I can see, is for farmers to raise more stock, work our land thoroughly, seed down more, and manure liberally from our own barn-yards. Many people argue that our land is not adapted to dairying. True it is not as well adapted as the land is in some parts of Canada but then we have the advantage of being able to grow a large quantity of grain in conjunction with dairying. As a general thing in dairy districts the other branches of farming are neglected; but my idea of farming is that it is better to have several irons in the fire, than to have merely one specialty, for if that fails you are in a tight place. With a certain amount of grain growing, a certain amount of dairying which necessitates more stock—you have more manure to enrich your grain land, more roots to feed the cattle, and last but not least, the necessity forced on you of keeping a sharp look out for a dry season, and the wherewithal to feed your cattle. In my judgment, one of the essentials of dairy farming in this locality is a liberal supply of green corn-stalks for fodder, to soil your cattle during the dry and hot months of summer, and the bare months of autumn. It is exceedingly difficult to keep cows milking regularly through the season without this provision. I could say a great deal on the subject of soiling during the dry months, I do not mean soiling altogether as we have never tried that; but hardly think it comes under the scope of this discussion. And now, supposing we all determined to keep more stock, the question naturally arises, what should we do with our milk? We are not in the neighborhood of Toronto or Montreal, or we would at once know what to do with it; we could dispose of it for domestic uses to much more advantage than by cheese-making. We have, however, another outlet in butter-making. Who does not know the hard work butter-making forces on our wives and daughters, who have enough to do in the house, without slaving over butter-making. Who amongst us has not tried on a hot day in summer to churn, when the butter would not come, and gone away in disgust. I do not mean to say that butter-making is not profitable, but where a number of cows are kept, it involves much more labor than cheese-making True, in some parts of the States butter factories are in vogue, but they have not come into universal use like cheese factories. We are all, of course, conversant with the old tub method of making cheese, and I do not doubt that quite as good cheese is made that way as by the factory system; but not as a general thing, for there is frequently about two cents per lb. difference in price for mercantile purposes. This is one reason for adopting the factory system, but there is another strong argument for it in the economy of production, or the saving of labor, the same process having to be gone through to make the cheese from the milk of five cows or fifty cows, as from that of five hundred. It is not too much to say, that whereas ten private dairies of fifty cows each would require ten skilled cheese-makers One factory for five hundred cows can be carried on by one skilled manufacturer, with two or three assistants, and do the work better. Mr. Pratt proceeded to explain the rise and progress of the cheese factory system and the whole operation of cheese-making on that system. He concluded with an earnest recommendation in favor of the extension of Dairy farming—and better cultivation of the lands.

Mr J Russell, Mr. A. McDonald, Mr. Joplin, Mr. Johnstone, Mr. Sidey, Mr. Lapp, and Mr. J. Burgess followed with good speeches in favor of the extension of dairy farming, more cattle, more cheese factories and better tillage We would gladly have published the proceedings entire—but our space forbids.

Mixed or Special Husbandry?

To the Editor of the CANADA FARMER.

SIR.—A few weeks since I read in your valuable paper, an extract from the speech of an agriculturist in Maine advocating the devotion by the farmer, of his entire capital and attention to some *particular branch* of his vocation, in order to secure success, and with the extract, a criticism also of the views expressed in it. With the criticism, I heartily concur, for my knowledge of farming in Canada teaches me that, though some may possibly succeed by pursuing such a system, the majority of Canadian farmers will not. The nature of our business, and the principles on which land is cultivated and grain produced, make such a course disadvantageous. Every kind of soil contains a variety of the constituent elements of vegetation, and different soils, even on the same farm contain these in different proportions, and every kind of cereal or vegetable raised on the farm extracts these in different quantities from the soil. This will be best illustrated by a comparison of the elements of wheat with those of the turnip. Wheat contains in every 100 parts:—

	Carbon.	Hydrog'n.	Oxyg'n.	Nitrog'n.	Water.	Other mat.
	39·4	6·0	37·1	3·0	14·5	2·0
Turnips	3·2	0·4	3·2	0·1	92·5	0·6

A comparison of other products of the soil would show further difference, but this is sufficient for my purpose. Every practical farmer knows that while wheat does not grow well after wheat, it does so after turnips, and the reason, as seen by the comparison given, is that the two crops, widely differ in their food requirements. The first wheat crop draws from the soil the constituent elements of itself, leaving the same soil sadly impoverished for the satisfactory development of a second crop, while the turnip crop only demands a greatly diminished proportion of the same constituent elements, and thus leaves the soil in a more fruitful condition for the succeeding wheat crop. Hence the indispensable and now universally acknowledged necessity for a *rotation of crops.* The necessity of a representation of the different classes of stock on a farm is equally urgent. This may be illustrated by a reference to the dairy business for the past three years; three years ago cheese was high, and dairy cows rose in proportion, and a great many farmers seeded down their farms, and bought cows at very high figures, expecting to realize large profits from the sale of milk. But the season (1871) was a very dry one; cheese fell, the cows failed in their milk, strange to say fell in price also; the dry weather made feed scarce for the coming winter. this, together with the depression of the cheese market, made cows cheap, and hundreds of cows were sold at a great reduction of the price paid for them. One farmer to my knowledge, who had seven cows thought dairy business so profitable that he would double his herd of milkers, and purchased seven more at about $40 each, taking the money from a bank to pay for them, expecting to replace it by the sale of milk. Well, to be brief the note in the bank had to be renewed until he could sell his grain in the fall. No matter how fair the prospects are for such a course, it is always dangerous, and the farmer who gives *attention to all* of the different branches of his business, keeping each in proper proportion, will, one year with another, be most sure of success. At present sheep and wool are above the average in prices, while pork and beef are below, and while this would justify the farmer in adding to his sheep and decreasing his cattle and swine in proportion, it would be utter folly to discard *all* his cattle and swine to be replaced by sheep, as the probability is that one or two seasons will in a great measure, if not entirely, reverse the demand and the prices. An increase to a certain extent may always be made in that which gives promise of paying best for the time, but this increase should not be so great as to become a risk, and should not lessen the attention paid to the rest of the business. The careful tillage of the wheat crop, because it is considered the most profitable, should not cause barley, oats, or peas to be slighted, for despite all the attention given to the former, it may fail, and then the others if carefully tilled will probably make up for the loss thereby entailed. To keep the soil of the farm in such a condition that it will yield grain abundantly, a great amount of manure must be made and used, and this can be best done by keeping stock, and attending to them properly, so that to sum up the whole briefly, the farmer will best secure success by attending to *each branch* of his vocation, as if it were a specialty, thereby securing as far as possible success in each, for the connection of the one with the other is such that the prosperity of the one tends materially to increase the chances of success in the rest.

AGRICOLA.

Jan. 21st, 1873.

When to Sell Pears.

A writer in the New York *Tribune* says that pears of any of the leading popular sorts bring the highest prices just as that variety is beginning to get scarce in the market, the price advancing to even treble that obtained for them when they are in the height of their season. Yet if these pears are kept in refrigerator houses until some weeks after their season is wholly past, and are then offered, they meet with very little demand and depreciate very low in price.

Flax Growing in Ireland.

The annual report of the Flax Supply Association of Belfast gives an unfavorable account of the crop during the past year as regards the area under cultivation, but highly encouraging in a financial point of view. The acreage under flax in 1872 compared with 1871 shewed a diminution of 22.23 per cent., but there was an increased yield of fibre amounting to 38.99 per cent., and had the weather been moderately fine during the grassing season the yield per annum would have borne comparison with that of the most prosperous years.

Excellent Whitewash.

As the house-cleaning season is approaching, it may not be amiss to say a few words in regard to whitewashing. There are many recipes published, but we believe the following to be the best. Sixteen pounds of Paris white, half a pound of white transparent glue, prepared as follows: The glue is covered with cold water at night, and in the morning is carefully heated—without scorching—until dissolved. The Paris white is stirred in with hot water to give it the proper milky consistency for applying to walls; the dissolved glue is then applied with a brush like the common lime whitebrush. Except on very dark and smoky walls, a single coat is sufficient. It is nearly equal in brilliancy to "zinc white," a far more expensive article.

The Census Returns.

The detailed returns of the census of England and Wales taken on the 3rd of April, 1871, have been published in two large volumes of nearly 600 pages each. According to the revised returns, the population of the United Kingdom, exclusive of the army, navy, and seamen abroad, was in

1871	31,628,338
1861	29,070,932

showing an increase in the ten years of 2,557,406, or 8.8 per cent. Ireland decreased 6.7 per cent. The number of men in the army, navy, and merchant service is estimated at about 229,000. The area of England and Wales, estimated in 1861 at 37,324,883 acres, is now estimated with the recent corrections at 37,319,221 acres.

Miscellaneous.

Hay is $80 a ton in Crescent City, Cal.

The maple sugar interest of Vermont now exceeds that of wool.

Kansas has shipped more cattle east than any Western State in 1872.

The cattle in Hardin Co., Iowa, are dying rapidly from a new disease, supposed to be rinderpest.

Farming rarely secures large fortunes, but it does better by producing large numbers of medium ones.

A Nevada farmer owns twenty-six camels, and he has to hump himself to get fodder for them this winter.

Central Iowa has had no heavy, soaking rain for three years, springs are dry, wells are low, cisterns are empty, and drouth prevails.

Mr. John H. Holden has sold to Mr. J. M. Fearnly, Inkerman Farm, the thorough-bred Ayrshire bull, "124," Duncan, (530). Price $250.

A California paper says, a Sonoma county farmer has achieved greatness by raising an ox weighing 4000 pounds. How high he raised it is not stated.

A farmer has presented the editor of the *South Arkansas Standard*, Arkansas, with a young pig, and still he isn't happy He says it takes corn to make pork

A "Down East" farmer thought he could hold a playful young bull by the tail, but his widow says he never could stick to anything ten minutes in his life.

In England, this year, 1,882 head of short-horn cattle have been sold for about $555,000. The average price was not far from $300, and the highest $7,250.

The English Prime Minister, Gladstone, is as enthusiastic a tree cultivator as was Horace Greeley, and spends much of his time trimming saplings at his home at Hawarden.

The West Northumberland Agricultural Society intends holding a Spring Fair at Cobourg on the 2nd of April. The same Society also holds a Horse Show at Cobourg on the 23rd of April.

A new Cheese Factory is about being started on the Haldimand Plains, Co. of Northumberland, in the Isaac Settlement, making the fourth Cheese Factory in the Township of Haldimand—we wish them all good success.

Milwaukee has shipped, this year, wheat and flour to the amount of 17,633,821 bushels. Its manufactures are claimed to foot up $20,000,000, of which iron and lager-beer are the largest, the former yielding $4,000,000; the other, $3,000,000.

Mr. Duncan Kay, of Galt, has imported from H. Beldons, England, one trio of Duck-Wing Game Bantams; one trio of Golden Pencilled Hamburgs, and one trio of Black Hamburgs. He exhibited these birds at Cleveland, Ohio, and took first prizes for each specimen.

A prospectus has just been issued in London, of the Texas Pressure Meat Company (Limited), with a capital of £150,000, in shares of £10, to establish a manufactory of preserved meats in Texas, under a patent of Mr T. F. Henley, for which £10,000 in cash and £40,000 in shares to be paid.

It is stated that since the passing of an act for the preservation of small birds and the protection afforded them by the Gun Licenses Act, the increase of small birds in the southern counties of England is marvellous. The finch tribes had become almost extinct, but this autumn clouds of goldfinches might be seen feeding off thistles.

Mr. John Arthur, of Meaford, has recently bought a thorough-bred two-year old bull, "Young Ontario," from Mr. Linton, Co. York; a three-year old cow, "Red Lady," from Thomas Marrs, Vespra; a pure bred Cotswold ram lamb, imported by Mr. Wells, Co. York; and two ewe lambs, same breed, raised by Mr. Armstrong, Co. York.

It has been found that boracic acid has a preservative action upon milk and beer, and it is stated that one grain added to a quart of milk keeps it sweet and fresh in hot summer weather for 120 hours, while milk not treated in this way will sour in 36 hours. The addition of boracic acid to milk does not injure it for use, the cream being separated far more slowly

An acre consists of 6,272,640 square inches, and an inch deep of rain on an acre yields 6,272,640 cubic inches of water, which, at 277,274 cubic inches to the gallon makes 22,622 2-5 gallons, and as a gallon of distilled water weighs 10 lbs., the rainfall on an acre is 266,225 lbs. avoirdupois. As 2,240 lbs. are a ton, an inch deep of rain weighs 100.933 tons, or nearly 101 tons per acre. For every 100th of an inch a ton of water falls per acre.

Paris is to have an "Insect Show" at the Luxembourg. The exhibition will contain noxious and useful *insectivora*, will show the productions of the latter and specimens of the ravages caused by the former. Amongst the "usefuls" is a little black fly, myriads of which appeared a few months ago to the great annoyance of the citizens. It would seem that this fly fed upon those infinitesimal insects that infest wall fruit, as well as those which do such injury to corn.

THE BUTTER TRADE.—Commenting upon the butter trade, the *Duchess Farmer* remarks, that the sales of butter of which the figures have been obtained, amounted, in 1870, to 514,092,683 lbs., which, at 30c per pound, realized the enormous sum of $171,364,236. The butter and cheese products together, are estimated to have amounted to $600,000,000, making a small allowance for the product going directly into consumption, of which actual figures are not obtainable.

It is cheaper the first spring, when one enters upon a farm, to plant without manuring. But it is hard, in autumn, to have worked all summer and then have but dubbed crops. If you repeat that way of farming the following years, it will be harder still, for the crops will go on diminishing, and it will soon come to no crop at all. Thousands have begun and ended in just this way. Other thousands have begun with an indomitable resolution never to put seed into a single acre till there was plant food enough in the soil to insure a heavy crop, so far as human providence and labor can effect such insurance. Within the sphere of our personal observation, these last have succeeded and have gained an honorable independence, though in many cases beginning with small means. We hardly need say that the former, though in some cases beginning with considerable means, have made a bad ending.

JAPAN, we all along supposed, in her reformatory measures, was almost entirely adopting our views and directed by Americans; but from a blue-book, or something of that kind just put out by the Japanese government, we find ourselves mistaken. Of the 214 foreigners now in the service of that government, who receive from $480 to $16,000 a-year salary, their nationalities are; English, 119; French, 50; American, 16; Dutch, 2; Prussian, 8; Chinese, 9; Indian, 2; Danish, 1; Italian, 1; Manilan, 4; Portuguese, 1; Paraguayan, 1. There are also 164 foreigners employed in the Imperial cities and by the local authorities of the provinces. Of these 50 are English, 19 French, 25 American, 9 Prussian, 15 Dutch, 3 Manilan, 42 Chinese and 3 Arabian; There are likewise over 100 foreigners living in the interior of the country as surgeons, teachers, engineers, and the like. Those who have imagined that Americans had some sort of predominance in Japan will be instructed by the above figures.

Mr Mechi sends the following "Note" on "Borrowed capital profitably invested":—"The time is fast approaching when the surplus capital of trade, and commerce, and manufactures will find its way to a food-producing channel. There is plenty of room for it, without any fears of its overflowing the banks. A farmer who owns the land he farms said to me last week, 'Twenty-two years ago I borrowed between £7000 and £8000 of the Government loan, paying 6½ per cent. per annum, to liquidate principal and interest in 22 years. I drained all my stiff land three feet deep, and a rod apart The 22 years have expired, and now I am free of charge, and have all my drains as perfect as at first, barring sundry removals of roots of trees, &c My land and crops have been improved, and it has been altogether a satisfactory and profitable affair.' Well, then, for 6s 6d an acre (less than the price of a bushel of wheat) annually during a period of 22 years the land has been permanently improved, the produce greatly increased, there has been a large augmentation of employment for labor and capital, and profit to landowner and tenant and the country at large. Why is it that some 20,000,000 of acres are still awaiting a similar manipulation?"

LIVE AND DEAD WEIGHT OF ANIMALS.—The amount of meat obtained from a domestic animal sold by its live weight is very variable, and experiments have recently been made in Liverpool to ascertain the proper allowances to be made. From the statistics to be derived from the public slaughter-houses of Paris or Brussels, it appears that the race and condition of the animal, besides many other circumstances, affect the result, and that certain animals yield as much as 70 per cent. of meat, while others only give 50 per cent. The mean weight of meat produced, however, is calculated at 58 per cent. of the live weight in beef cattle. In the case of sheep, the proportion is from 40 to 50 per cent. From experiments made, it appears that the different products obtained from oxen and sheep are as follows:—an ox of the live weight of 1,322 pounds yields, meat, 771.4 pounds, skin, 110.2; grease, 88; blood, 55.1; feet and hoofs, 22; head, 11; tongue, 6.60; lungs and heart, 15.33; liver and spleen, 20.5; intestines, 66.15; loss and evaporation, 154.322—making the total of 1,322 pounds. The products from a sheep weighing 110.02 pounds are as follows:—meat, 55.1 pounds, skin, 7.714; grease, 55.1; blood, 4,408; feet and hoofs, 2.204; head, 4.408; tongue, lungs, heart, liver and spleen, 4.408; intestines, 6.612; loss and evaporation, 19.836,—making the total of 110.02 pounds.

ENGLISH FARMING, THEN AND NOW.—Mr. Mechi, looking at the past and present of English agriculture, expresses himself thus as to the result: "Awakening from her sleep—what a stir at last in agriculture! Beet sugar companies, steam-cultivating companies, land-improvement companies, land-drainage companies, irrigation companies, agriculture tramway companies, and nobody knows what beside; not forgetting class schools, agricultural colleges, tenant right and laborers' associations. All new in my time, and some predicted by me in my early letters some 30 years ago. Cow farming is going out; in fact, has died out in this neighborhood, where once there was an abundance of them. Why is this? Corn farming has come in, and rents have increased, and Mr. Mechi's false idea about poor grass land has proved to be a correct one. Poor grass land and no cultivation will not pay "improved" rents and rates and taxes, although cultivation, corn, roots, and artificial grasses will do well. Farmers have gradually realized the fact (predicted by chemistry) that cow manure is poor and will not force good corn (grain) and root crops like that from fattening animals. * * * The right thing is to breed and fatten, and thus grow plenty of meat and corn concurrently. That is my practice with sheep. Selling lean stock means impoverished farms, unless much artificial food and manure are used.

U. S. Exports of Agricultural Products.

The *Journal of Commerce* gives a table of leading articles of export from New-York for the past three years, from which we condense the following:

	1870.	1871.	1872
Beeswax, lbs.,	277,205	233,926	267,641
Breadstuffs—			
Wheat flour, bbls	1,956,231	1,659,755	1,179,050
Rye flour, bbls.,	4,433	4,218	6 359
Corn meal, bbls.,	84,716	123,465	189,577
Wheat, bush,	18,156,655	21 988,643	15,151,946
Rye, bush.,	32,431	525,772	648,747
Oats, bush.,	98,986	47,310	51,854
Barley, bush.,		98,735	22,906
Peas, bush.,	151,102	80,139	156,163
Corn, bush.,	487,702	13 636,170	25,192,176
Cotton, bales.,	505,449	598,703	401,762
Hay, bales.,	39,139	51,169	24,141
Hops, bales,	20,739	17,830	6,163
Oils—lard, galls.,	22,114	22,917	170,267
Linseed, galls.,	7,880	12,760	7,471
Provisions—Pork, bbls.,	88,050	165,685	178,121
Beef, bbls.,	24,496	45,477	26,64
Beef, tcs.,	57,885	80,402	49,685
Cutmeats, lbs.,	30,626,699	90,455,254	269 756,114
Butter, lbs.,	1,399,354	7,500,347	4,814,427
Cheese, lbs.,	61,710,435	70,215,881	67,160,548
Lard, lbs	32,074,063	125,524,276	173,730,373
Rice, tcs.,	1,174	72	11
Do., bbls.,	23,161	12,339	27,174
Tallow, lbs.,	18,245,508	42,912,410	55,866,302
Tobacco, crude, lbs.,	87,968	112,659	177,486
Do., manuf'd, lbs.,	6,431,176	8,570,343	8,910,683

Chicago Live Stock, 1872.

The following is a summary of the Seventh Annual Stock Report of the Union Stock Yards and Transit Company. There was a large gain over 1871 in the receipts of cattle, hogs, and horses, and a slight decrease in the sheep trade.

The value of live stock received at the yards in the year 1872 was:

Cattle	$41,000,000
Hogs	33,500,000
Sheep	900,000
Horses	25,000
Total value	$75,475,000

The following table will show the receipts of stock during the twelve months ending Dec. 31:

Cattle	684,075
Hogs	3,232,613
Sheep	310,211
Horses	12,145
Total head all kinds	4,239,054

The shipments during the same period were:

Cattle	510,015
Hogs	1,835,194
Sheep	145,016
Horses	10,037
Total	2,501,262

There were 109,086 car loads of stock received and 54,275 shipped. The average weight of hogs received during the year was 249¼ pounds.

Breeder and Grazier.

Springwood Herd.

The illustration which appears on this page is the portrait of Lieut.-Col. Taylor's short horn bull, SEVENTH EARL OF OXFORD— an animal holding very high rank among the bovine aristocracy. Seventh Earl was bred by Mr. J. O. Sheldon of Geneva, N. Y., and passed into the hands of Messrs. Walcott & Campbell of New York Mills, when Mr. Sheldon sold his magnificent herd to that firm for the reputed sum of $110,000. Colonel Taylor purchased him last year from Messrs. Walcott & Campbell, and he has since stood at the head of his herd. The Oxford family holds all but the highest rank among the great short-horn families of the world, and the value of its scions has constantly tended upward in England and America for some years past. At the famous auction sale of the Duke of Devonshire in September, 1871, eight animals of this family averaged $3,099 each, and among them was a white bull that brought $5,000. At Lord Dunmore's sale, too, last autumn, three animals of the Oxford family averaged $5,300 each. The value of SEVENTH EARL OF OXFORD will be perfectly understood by all short-horn men, from the following pedigree:—

7th Earl of Oxford, 9985.

RED,- calved 6th September 1869, bred by J. O. Sheldon, of Geneva, N. Y. Got by 5th Duke of Geneva, 7932, bred by Mr. J. O. Sheldon.

Dam 10th Lady of Oxford, by 10th Duke of Thorndale, 5640, bred by S. Thorne.

g. Dam 7th Lady of Oxford, by 6th Duke of Thorndale, (2794), bred by S. Thorne.

g. g. Dam 2nd Lady of Oxford, by 2nd Grand Duke, (1296), bred by S. E. Bolden.

g. g. g. Dam Oxford 13th, by 3rd Duke of York, (10166), bred by T. Bates.

g. g. g. g. Dam Oxford 5th, by Duke of Northumberland, (1940), bred by T. Bates.

g. g. g. g. g. Dam Oxford 2nd, by Short Tail, (2621), bred by T. Bates.

g. g. g. g. g. g. Dam Matchem Cow, by Matchem, (2251), bred by C. Mason.

g. g. g. g. g. g. g. Dam by Young Wynyard, (2859), bred by the Countess of Antrim.

Springwood, the residence of Col. Taylor, is a small but valuable property in the suburbs of our flourishing young city of London.

Col. Taylor, like many other military men, has immense admiration for the short-horn breed of cattle, and gives much of his spare time to the right management of his herd. He keeps himself fully posted on short-horn matters all over the world; and is an excellent judge of a good animal as well as of a good pedigree.

Col Taylor's herd at present consists of 11 short-horn cows, 9 heifers, 3 bulls, and 3 bull calves; 26 animals in all. Of the 20 cows and heifers, 16 are of the noted Craggs family, which dates its origin from the famous herd of Mr Thomas Bates. The pedigree of any one of the 16 animals, speaks for the whole; and here is the pedigree of one of the recent arrivals:

"8th DUCHESS OF SPRINGWOOD; Rich Roan; calved 13th January, 1873, got by Seventh Earl of Oxford, 9985, dam, Duchess of Springwood by Proud Duke, 8879, g. dam, 2nd Duchess of Portland, by Duke of Richmond, 3886, g.g. dam, Duchess of Portland, by (Imp.) Lord Dacre, (13181); g g g dam, (Imp.) Alice Maud, by Grand Duke, (10284); g g.g.g. dam, Cicely, by Duke of Northumberland, (1940); g.g g g g. dam, Craggs, by Son of 2nd Hubback, (2683); g g g.g.g.g. dam, Craggs, bought of Mr. Bates, of Kirklevington, and descended from the herd of Mr. Maynard, of Eryholme.

Of the other 4 cows and heifers three are of Mr. Harrison's (of Morley, N. Y.) Lydia Languish family, with a good old pedigree, tracing back to the herd of Sir George Strickland. The fourth is a recent purchase from the Hon. Ezra Cornell, of Ithaca—"Kirklevington 14th"—with a first-rate pedigree.

Besides SEVENTH EARL OF OXFORD, Col. Taylor has another first-class bull—22nd Duke of Airdrie—recently purchased from Mr. A. J. Alexander, of Kentucky. He was sired by Royal Oxford, (18174), and goes back through a long line of illustrious progenitors to James Brown's Red bull (97). A better pedigree hardly exists.

It will be seen from all this, that if Col. Taylor's herd is not large, the animals composing it are highly bred and likely to be heard from at future Provincial Shows.

Weaning Lambs.

It is very frequently the case that lambs are let run with their dams too long, which has an injurious effect upon both. So long as they run together, the lamb will depend on the milk drawn from its mother for sustenance, which often does not amount to much, consequently, both are the worse for not being separated. Persons who have had large experience in sheep-raising generally agree that four months is the proper age to wean lambs of all breeds. An idea prevails to a considerable extent that it will not do to separate lambs from the ewes in "dog days." This is all fudge, and the sooner superstitious ideas are abandoned the better. Provide good pasture and give them good care, is the all-important consideration. When separated, the lambs should be put so far apart that they will not be in hearing of each other, as this causes them to be restless and uneasy. Do not turn the lambs on fresh clover pasture, as it is certain to cause souring and other ailments; good timothy and blue grass is the best, but it should not be very long. As soon as pasture begins to fail, or at least so soon as the first frosts have touched the grass, a little extra feed of some sort should be given. Oats and bran mixed together make a nice feed to begin with, and a little salt added to it will give them more of a relish for it; rye also makes a first rate feed for them, but it is not quite so well relished; corn makes an excellent winter feed, but care should be taken at first not to feed too much at a time. It is best to put a few old tame sheep with the lambs to teach them how to come when called. The ewes should be put on the dryest pasture on the farm for a few days to assist in drying up the milk, and it may be found necessary to milk some of them a time or two. Should cold rains prevail during the early fall months lambs should be put under shelter, and have some hay given them in the racks; and as the season advances they should be kept in of nights. By doing this by the time winter sets in, they will be so taught to eat that the change from pasture to dry feed will not be perceptible. It will not require a person to keep sheep many years until he will find out that the main thing in wintering them is to keep them up in the fall, for if permitted to loose flesh then, they will not recruit up again during the entire winter, more especially is this the case with lambs.—*Agricultural Commonwealth.*

SHORT-HORN BULL—Seventh Earl of Oxford, 9985.

At a recent sale of an English stud of horses, Blair Athol brought $62,500; Gladiator $85,000, and the whole number, 273 colts, horses and mares, sold for something more than $500,000.

Use Full-Blood Rams.

A Correspondent of the *Agricultural Commonwealth* makes the following suggestions. Perhaps the most important step in securing and maintaining a good flock of sheep is the securing of males that are the perfect type of what you wish your flock to be. As to what a male should be, I would say, first, let them be thorough-bred. No grade buck should ever be used when there is a desire to improve, or even keep up the quality of the flock, even though he may be the most desirable in appearance of the whole flock. The chances are against the transmission of his desirable qualities; it is probable he will transmit undesirable qualities of his ancestors that are concealed in him. A thorough-bred male can be relied on to reproduce himself in his offspring, but such is not the case with a grade, however perfect he may be in form. Second, I would say let him be a good specimen of the breed (whatever that breed may be). Among the best of the flocks there will be a difference. While all may be good, some may be better and others best. I would say get the best at any price, in selecting males. Be sure he has an eminent degree of all the essential points of the breed in size, make, characteristics of wool, etc. Again, let him be sound in constitution and limb. It is found that defects and disease are more easily communicated to offspring than more desirable qualities Hence everything of this kind should be avoided with scrupulous care. The character of the female is of less importance. True, if a man has a flock of thorough-bred ewes to begin with, all the better, his work is half done; but if he has a flock of grades or scrubs he need not go to the expense of buying a full-blooded stock to build up a flock with. With proper care in the selection of bucks, a flock can soon be built up to a high point of excellence with only common ewes to start with. With the facilties now offered for securing choice bucks, there is no excuse for the man who continues to propagate the scrub stock of the country. Let none but the first-class males be used, and soon all our flocks will become first-class flocks.—*Rural New Yorker.*

Growing Out a Hoof.

It is the universal habit to destroy a horse that has lost a hoof, and this is upon the hypothesis that the horse is lamed for life and rendered unfit for any work. We find, however, that, if allowed, nature will in time perform her own cure, and restore the missing hoof, as the following remarkable case will show, which we extract from a late number of the *San Francisco Call*.—

"Yesterday we met with a horse which had its hoof torn off by the wheel of a dray on Howard street some weeks since. The owner was advised at the time to shoot the horse, but the animal being not only a valuable but a favorite, it was determined, if possible, to effect its cure. The horse was slung for nine days, during which time it suffered most acute pain, the nature of which may be imagined in a degree by any one who has had a nail violently torn off. After this time the pain apparently abated, and the horse was lowered to his feet, the wounded foot being well preserved from any undue amount of exertion. The horn, or hoof, has now grown two-thirds of its natural size, and in a proper shape, and it is hoped that by grass time the horse will be fit to turn out, and that by summer the hoof will be sufficiently strong to bear a shoe, and allow the animal to return to work. The cure has been brought about by humane treatment and constant care. The horny matter has secreted itself in the same manner as the matter which composes our nails, is secreted.—*Ohio Farmer.*

Ayrshire Cattle in Cold Climates.

A farm near this city, containing 170 acres, has now upon it 40 head of cattle, all either full-blood or high grade Ayrshires, put into the stables on the 15th Nov. last—since which time we have had frequent snow storms, with snow at least 3 feet deep in the woods, and extremely cold weather (down to 30° below on Dec. 26, and to 20° again on Jan. 12), freezing the manure in the stable a great portion of the time—now half wintered on the straw of 7½ acres of oats, barley and peas, with about 200 bushels of mangolds, and the fodder of 1½ acres of Western corn, planted in drills, and put away in the mow with the straw above mentioned, in alternate layers, *without any hay.* In this herd are several cows in milk, making an average of 2 lbs. of butter daily. One dry two-year-old heifer was killed for beef on Jan. 4th. and the same week a new milch grade cow was sold for, $75, showing the condition of this straw-fed herd. If there be any other breed of cattle that can be kept in a thriving condition with the quantity and quality of food supplied to this herd, it would be of vast importance to farmers and dairymen, particularly those who are located in the northern portions of the United States and Canada, where animals are housed and fed (as all should be) in the manger, say 6 months in every 12, it is to be hoped that such information may be published.—*Charles Shepard, of Ogdensburg, in National Live-Stock Journal.*

Soiling in Germany.

A letter from Germany, published in the *Scotsman*, gives some interesting statements as to the mode of feeding cattle in that country. The system, in fact, is what is known in the United States as "soiling," and its success with the Germans will give increased strength to the arguments in its favor. The writer—an Englishman, evidently—says:

"The German method of cultivation differs materially from that of the English in some respects. The triennial shift of crops is not considered good; but their system varies very much in different parts of the country. For the most part, however, it is much more intensive. with, proportionally to the extent farmed, far more ground under tillage than in Britain. With the breeding of cattle, they proceed on an entirely different principle. Instead of allowing them to graze on fields and meadows, they are almost entirely kept in byres (cow sheds), and in this manner they are thought to produce proportionally far better returns to the farmer than otherwise. It is very rare to see animals grazing in fields in Germany. Recently the *Landwirth-schaftliche Zeitung* contained an account of some experiments made by a gentleman named Patow, which had extended over a period of twenty-five years, and in which it was agreed that these showed the objections to the feeding of cattle in the stall to be groundless. The experimenter states that on an average a gain of 788 thalers is obtained if they are so fed, instead of pastured on 24 square roods of land. As regards the health of the cattle, the result was also found to be in favor of stall feeding He had during 17 years an average of 120 head in his byres, and the death rate by stall feeding was only 1 07; Nor was the system found to impoverish the soil, for the increase of the produce of grain was from ½ to 2½ in 21 years. Under it also a far larger quantity was obtained of farm-yard manure, upon the use of which the German agriculturists lay great weight. Their writers on the subject speak in severe terms of the English waste of this material, arising, they hold, from the defective construction of their farm yards, and their whole system of breeding cattle, &c. Town sewage is also fully utilized, nothing that is available being allowed to go to waste."

Does it Pay to Cook Food for Stock?

We will state that our farm contains 700 acres, and we generally feed 100 head of cattle on grass in summer, and we fatten each winter about forty head of cattle in stable. We raise from forty to fifty acres of wheat, twenty to thirty of oats, twenty of corn, and three or four acres of Swedish turnips. Our engine is driven by a five-horse boiler, with engine attached to its side. And this threshes our grain, cuts and steams the fodder, pumps the water, saws the wood, and does the churning, and thus is very handy to have on the farm. We have three steam boxes, holding 100 bushels each, and one of these filled with cut straw and chaff, with 200 pounds of bran, worth 75 cents per hundred, evenly mixed, moistened with water, packed in solid, and well steamed, will feed sixty head of cattle three times for one day, all they will eat. Fattening cattle are fed extra. In this way we can feed all our straw and corn-stalk, and poor hay, if we have any, with a little grain or bran, turn it all into quick, active manure to stimulate new crops, and can keep much more stock, and at one-third less expense than in the old way. Our stock comes out in better condition in the spring, and we have no doubt from our experience that there is a saving to us of fully one-third in the cost of wintering our animals. In feeding hogs we find that two bushels of corn ground and cooked is a little better than four bushels of shelled corn. We have proved this by the best test we can give it. We have no hesitation in saying that our confidence in the economy of this mode of feeding strengthens with each year's experience, and we believe it is destined to be practiced much more extensively in the future, —*Dewey & Stewart—Live Stock Journal.*

Cotswold—Merino Sheep.

One advantage that sheep possess over other varieties of stock is, that the carcass can be disposed of for mutton at any age, and costs very little if any more to produce than other kinds of meat; while the fleece will usually pay all the cost of keeping. And as both items, the wool and the carcass, are sources of profit, both items demand the attention of the wool-grower. A sheep that will combine in the same animal both these qualities in perfection, is the sheep demanded by the farmer. While the American Merino, it is generally acknowledged, has the superior claim in respect of wool, the Cotswold and Southdown are far more profitable for mutton. The Leicesters are so similar to the Cotswolds, and they are so generally mixed together, that none but experienced breeders can recognize any difference betwen them, that I do not speak of them as a separate class, although I think they are inferior to the Cotswolds. I am satisfied that the wandering Merino, weighing one hundred pounds, will consume as much food as the lazy Cotswold weighing two hundred pounds. I am also confident that the most profitable sheep is a cross between the Cotswold and the Merino. The fleece of this cross is heavy, compact, and of good quality. It is also highly prized by the manufacturer. Lambs produced by breeding Cotswold bucks on good Merino ewes, are strong and healthy, and will weigh at maturity about 150 pounds; while the weight of a flock of Merinos will hardly average 100 pounds. The fleece of this cross will usually average nine to ten pounds; while the average weight of the Merino fleece is five to six pounds. This cross produces a sheep that is more healthy, and more profitable. In this cross-breed the liability to foot-rot is also avoided, as the feet of the Cotswold and Southdown are always sound.—M. Briggs, *in "Chicago Live Stock Journal."*

Roots and Oil Cake for Sheep.

If growers of combing wools should raise sheep primarily to produce mutton; should attend to the breed, and keep their sheep well fed, and care for them generally; and should also try to mature them early, so as to sell the carcass—we should have wool from well fed, young, healthy, strong, well bred, fat sheep, which is just the wool wanted for combing and delaine purposes. Farmers cannot keep these large sheep on lean pastures, with but little care of them, and have good wool. And the great reason the combing wool sheep run out when brought from England and Canada is, that they do not get the same care and treatment they had in those countries, and are often kept on soil they are not adapted to, and are not fed sufficiently. The wool from a Leicester sheep that has been in the United States two years is generally harsher, leaner and worth much less than it would have been if the sheep had stayed in Canada or England. Now, this will not always be so, for growers will yet learn that these large sheep need more to eat than the small Merino, and their food should not consist of Indian corn, but they should have some roots, mangel wurtzel and oil cake. When sheep are fed on corn, they are too hot and feverish, and the wool becomes harsh and brittle, while a proper supply of roots and oil cake with other food would produce soft, sound and elastic wool.—*U.S. Exchange.*

Oil Meal for Calves.

We take the following statement of experience from *The Ohio Farmer*:—Last spring, a year ago, having two good steer calves, I thought I would know its value from experience. The calves were taken from the cows at three days old and taught to drink at first sweet milk—were fed until the stomach became strong, when wilk that had stood over one milking was fed twice a day. I then commenced to feed oil meal to them. To prepare this, take a little boiling water and stir in the meal until it is thick enough; then put it into the milk to be fed. What can be taken up with one hand is plenty at first, the quantity being increased as the animal grows older. If too much is given, scours will be brought on, when the quantity must be reduced. I continued feeding until pumpkins were ripe, when the meal and milk were omitted, and pumpkins fed as long as they were to be had. By this time the calves were fat, and came into winter quarters with heads up. Good hay and stable were furnished, with no grain, until February, when oats were fed until they were turned to grass, and have been all summer without anything else, and to-day, Oct. 5th, they weigh 2,210 pounds. The country is full of steers two years old that are not so heavy.

The Dairy.

Butter-Making Temperatures.

We do not think an abundance of running water absolutely essential to the best results in butter-making, if you can keep the temperature of the milk room at the right point. It is only necessary to reduce the temperature of the milk to about 70 degrees soon after it is drawn from the cow, if you can set it in a room with a temperature of 58 or 60 degrees. Indeed, it is our impression that surrounding milk and keeping its temperature down with cold water, while exposing the surface to a temperature varying with the weather, is injurious to the flavor and the keeping qualities of the butter.

The best temperature for raising cream, it is admitted by our best butter makers, is about 60 degrees. The variation should not be much above or below this. At this point we should prefer, if possible, to keep the temperature of the milk room the year round. In it we would keep the milk and cream until it was ready to churn If you go below this, it retards the rising of the cream and we think injures the butter. It is a pretty well established fact that the best cheese can not be made out of milk that has gone much below 65 degrees. Below that the sweet nutty flavor disappears. We think that when we begin to go below 60 degrees, we begin to loose the rosy smell and aromatic flavor of our butter. It may remain sweet, but it has forever lost that delicious, creamy taste which is a peculiarity of fancy butter, and when afterward exposed to a higher temperature, decay is more rapid because of the chilling it had received. We would not, therefore, if we could as well as not, let milk go below 60 degrees—certainly not below 58 degrees.

The best temperature for churning is somewhere between 60 and 65 degrees—about 62 or 63 in summer, and 65 in winter. If you begin churning at 60, even in a room of that temperature, you will raise the temperature of the cream two or three degrees in a very short time, and increase the bulk. It is not the season alone which demands a variation in the temperature of the cream between summer and winter—that you should churn it warmer in winter and colder in summer. It is true that in warm weather the tendency of the temperature is to rise, and in cold weather to sink. But there is another reason why a higher temperature is required in winter than in summer. It is found in the composition of the butter. In summer, there is more oil and less hard fat in the butter. In winter, there is more hard fat and less oil. In winter, the proportion of hard fat to oil is about 60 parts fat to 40 parts oil. In summer, this proportion is reversed, and we have about 40 parts of hard fat to 60 parts of oil Hence, butter at the same temperature is harder in winter then it is in summer. This is of itself sufficient reason for churning at a higher temperature in winter than in summer.

It is well known that the flavor of butter made in the summer is better than that of butter made in winter. It is not because there is more oil in summer and less hard, tasteless fat. It is not exactly known what gives butter its peculiar flavor We suspect the flavor is imparted by some quality in the oil, and that where we diminish the quantity of oil and increase the quantity of hard fat, we weaken the flavor and make the butter insipid We would like to see some experiments tried to decide this point If we are right, the butter from a cow noted for the high flavor of the butter, will contain a larger proportion of oil than the butter from a cow whose product is comparatively tasteless.—*Utica Herald*

A Creamometer.

It is frequently desirable to know the comparative value of the milk in the different cows of a given herd. Sometimes it is the case that in a herd of 10 or 12 cows one or two will be almost valueless, by reason of a poverty of cream, and where the milk is all mixed together, it is impossible to tell what cow it pays to keep, and those it does not. The creamometer is easily constructed, and will show both the relative and the actual value of each sample of milk Take any straight glass vessel, such as a test tube, or what answers an equally good purpose, a glass bottle whose sides are even, and on this paste a half inch strip of paper, first marking a scale of tenths or hundredths upon it. When filled with milk, these marks will indicate the per cent. of cream.

We have one before us which has been filled twenty-four hours, and the cream marks 12 per cent. flush. Is this unusually rich?—*Ex.*

How much Milk to a Pound of Butter.

Having asked several of my old friends, in the same business as myself, the above question, and not being able to obtain very satisfactory answers, I found myself compelled to solve it alone. The course of reasoning pursued was, that a fair answer could only be obtained from a comparison of the product of a large number of cows, and that it would not do to base an answer upon the doings of one cow or even one dairy though a large one. I obtained the report of seven butter factories in New York, representing 108,873 pounds of butter per annum from over 800 cows; from these I found that a careful average showed that one pound of butter required *twenty-three and one-half pounds of milk*; it was also evident that either there was a difference in the quantity of the milk furnished to the different factories, or else in the perfection of the plan pursued by each one in separating the butter, for these averages varied from twenty pounds of milk at the Davis Factory, Herkimer Co., to twenty-five pounds at the Berry Factory, at Malone. Although not properly in place, I may state that the average price of the 108,873 pounds of butter was thirty and one-quarter cents per pound.

The Davis Factory is essentially a cheese factory, but by an accident to their boiler, were compelled to convert one day's delivery of milk into butter; this amounted to 4000 pounds and to the surprise of those engaged in the manufactory, made 200 pounds of first class butter. The Keeler factory reports an average of twenty and three-quarter pounds of butter from twelve quarts (wine measure) of milk.

Experiments with my own dairy of twenty cows, during last month, has convinced me that one pound of butter from twenty-three pounds of milk is a fair average, and yet I could select individual cows from my dairy whose average would require much less milk.

It is but reasonable to suppose that other items being equal, it will require more milk to make a pound of butter in June than in December; that the same comparison will hold good with regard to the milk of a fresh cow, and one nearly dry; and also, with a cow kept on dry fodder and meal, and one fed altogether upon green clover, though I have not found green corn to decrease the average of butter in anything like the proportion that good clover pasture will —*Journal of the Farm.*

Butter Making.

Milk for butter-making should be handled gently and put at rest as soon as possible. A reduction of temperature is desirable as soon as the milk is drawn, but this should be effected with the least possible amount of stirring. The more it is stirred the less will be the yield of cream. When set, it should be protected from even the least jar. Churning in a milk room, or any work that jars the building, will retard the rising of the cream Milk, to get the best yield of cream, requires absolute and undisturbed rest.

Should milk be set in deep or shallow vessels? This is still a disputed point. Many experiments have been made, and the evidence seems to show that it makes little or no difference in the yield, whether set deep or shallow. It is more convenient and saves labor to set in pails, or in large pans that will hold the entire milking of a dairy. The tendency is, therefore, to deep setting, or to setting in large masses. Good results are obtained by both methods. We have had no experience and but little observation in regard to the matter; but from what little we have seen and from the testimony we have read and have received from the lips of dairymen, we are inclined to favor setting in large pans—large enough to hold a whole milking—and not over four to six inches deep. In this way, the cream, having less distance to rise, will separate from the milk sooner, and we get the benefit of the action of more light on the milk and cream, which our fancy butter makers consider essential. But there is no doubt that the cream will rise through any depth, if we keep the milk sweet long enough. It is a very little lighter than milk, and rises slowly, by virtue of the law of gravitation. It will therefore rise a short distance sooner than it will a longer one; but it always has an upward tendency so long as the milk remains in a fluid state, and even separates partially in the cow's bag. This is the reason why the first milk drawn is the poorest, and the strippings the richest—almost clear cream. As the milk stands in the cow's bag, the bottom is drawn first, and the top or cream last.—*Utica Herald.*

Old Pastures for Cheese.

An English correspondent of the *Country Gentleman* says:—"Under no circumstances would an old established dairy farm, famed for fine flavored cheese, suffer the peculiar rich and mellow taste imparted by the particular herbage grown in the dairy fields, to be tainted by the product of inferior grass, or, on the other hand, permit the cheese of other parties to be benefited at the expense of this sweet and most pleasant flavor. In parts of England where arable land prevails, and where the land in permanent grass has never produced any cheese of a quality beyond mediocrity, it is possible factories may arise, for doubtless the management in making is superior by far to where only second-class cheese is manufactured. Good second-class cheese can not be made from clover pasture, or any of the temporary grass land under the usual style of manufacture there, for it will not keep to get old enough to suit the best customers, and cheese which requires eating while comparatively new, has to be consumed by the working classes, who will not and can not pay high prices."

The writer, after complimenting the American system of manufacture, and giving due credit to the excellent quality of our cheese, again goes on to say: "It is an utter impossibility to impart the flavor given by the old natural grasses growing in century-old dairy fields, to cheese made from clover or any artificial or temporary pastures. This is so well known in England, that the dairy cows on the best dairy farms are always, when in milk, confined to the old dairy land, and on most of these farms there are fields which only a fence divides, which would spoil the uniformity of the cheese by giving the cows access thereto. It makes a difference in butter-making, too, for though not quite so quickly shown, yet there is land which will not do to graze with milch cows, from which a genuine good article is required; and though, of course, both butter and cheese must be manufactured in a cleanly and proper manner, yet much depends on the food the cows eat, as the best managers can not get rid of impurities which have been brought into the milk from rank, sour or unsuitable forage."

Packing Butter for Transportation.

J. T. Ellsworth, of Barre, at a meeting of the Massachusetts Board of Agriculture last year, being asked to state his mode of packing and transporting the butter which he makes to market, said—"My whole aim is to keep it from the air. I do not want any kind of air to reach it. If it is pure air, it will abstract the sweet flavor; if it is bad air, it will do harm, of course. I cover it from the air from the time it is salted until it is worked. Then it is boxed as soon as it can be, and covered. I have three different sizes of boxes. My shipping box is something like an old-fashioned tool-chest, and holds four boxes of thirty pounds each. The shipping-box is two boxes high and two boxes wide. They are the common round butter boxes, but the shipping-box is a square box, with handles at each end. A rod comes up at each end, and there is a thumb-screw outside on the cover. Listing, such as comes on the sides of cloth, is tacked around the edge of the box. When the cover is screwed down the box is pretty tight. You will see that there is a vacant space between the two boxes, something like a three-square, I had two galvanized iron boxes three-square or nearly so, that just fit into that cavity, and these were filled with broken ice, about the size of a hen's egg, the butter put in, and the cover screwed down tight, in time to meet the express train, and my butter gets to the stall at half-past eleven, a. m. Two-thirds of the ice is in the boxes, and the butter, I have been told, is apparently as hard as when it started.—*Vermont Farmer.*

NEW STYLE OF MILK PANS.—The *Jeffersonian*, of West Chester, Chester county, Pa., describes some extraordinary milk pans lately made at that place for the dairy of Enos Bernard. They each measured twelve feet in length and four in width, and were about six inches in depth. They were double bottomed, with a vacuum of about one inch between, which space was divided into four compartments by partitions running lengthwise, and were so constructed as to allow water to pass up and down the length of the pan, thus keeping the milk cool or warm at the option of those having it in charge. The four pans had capacity sufficient for containing the milk of one hundred cows, which number Mr. Bernard keeps. It is said, by those who have tried this new kind of pan, that a much greater amount of cream is obtained from the same quantity of milk, besides obviating considerable trouble and labor. When the cream is skimmed from the surface, the milk is drawn off at the bottom of the pan.

Veterinary Department.

Structure of the Horse's Foot.

In connection with the internal parts of the foot there are two tendons, an extensor and a flexor and both are attached to the coffin bone, the former to the coronal process on the upper part of the wall, and the latter to the ridge at the back part of the solar surface. Surrounding the upper part of the coffin bone and partly situated within the concavity on the upper and inner part of the wall of the hoof is a highly vascular and important structure called the coronary substance, which is formed of a fibro-cartilaginous band united to the bone by dense areolar tissue, and resting upon the cartilaginous basis is a plexus of bloodvessels, and the whole covered by a cuticular coat extremely vascular.

Continuous with the coronary substance and descending upon the wall of the coffin bone are a great number of plates or folds, which are designated the sensitive laminæ, in which ramify the vascular plexus emanating from the bone. The sensitive laminæ are very highly organized and are firmly attached to the horny laminæ on the wall of the hoof. The sensitive sole lines the solar surface of the bone, and is continuous with the laminæ, and is also formed of a fibro-elastic vascular membrane.

Occupying the back and central parts of the foot, and filling up the irregular space between the lateral cartilages, and flexor tendon is the sensitive or fatty frog which is also formed of vascular structures and from which is secreted the horny frog. The foot is very liberally supplied with blood which is derived from the plantar arteries which pass down and terminate within the coffin bone, forming the circular arteries from which spring numerous smaller vessels.

Having very briefly noticed the more important parts in connection with the foot, we will now notice some of its diseases as *Laminitis*, or Founder.

The disease usually designated, founder, laminitis, fever in the feet, is one often noticed amongst the horses in this country and as its name laminitis implies, it signifies inflammation of the sensitive laminæ; the inflammatory action, however, is not alone confined to the laminæ, but the other sensitive stuctures are also attacked. Acute laminitis is a very serious disease and is one of the most painful affections to which the horse is liable, the parts affected are extremely sensitive and the hard and resisting hoof adds to the severity of the diseases of the foot generally.

In laminitis the same changes occur as in inflammation in other parts of the body, often producing separation of the sensitive and insensitive laminæ and sole, and allowing the bone to descend causing a bulging of the sole, which is known as pumiced foot.

The heavier breeds of horses that have broad and flat feet, are predisposed to laminitis; but it may occur in a very violent form in any kind of feet. The great exciting cause being hard or fast work when an animal is not in a fit condition to undergo violent exertion; the shoe bearing too heavily upon the sole is another common cause, especially in horses with flat feet. It is apt to follow derangement of the digestive organs, and, therefore, very violent attacks frequently supervene upon an attack of gorged stomach, or from an animal eating a large quantity of oats, wheat, or barley; or from drinking freely of cold water immediately after a fast drive. Laminitis is very prevalent during the hot months of summer.

Symptoms. The patient exhibits all the symptoms of high fever, attended with great pain, and disturbance of the normal functions; therefore the pulse is quick, full and bounding, the horse is so stiff and sore, that it is with the utmost difficulty he is got to move. The fore feet are oftener affected than the hind ones, and when the disease is altogether confined to the fore feet the action is marked and peculiar, he throws his weight to a great extent upon the hind legs, causing an arching of the loins and trembling of the flanks. When both fore and hind feet are affected, the action is somewhat different, every movement gives him intense agony, and there is a peculiar twitching of the hind limbs at every step. The plantar arteries are throbbing and the feet are extremely hot; the breathing is also quickened, and in the most of cases the bowels are very costive. If you attempt to force him backwards he draws his fore feet along the ground. Sometimes he will lie down upon his side with his head stretched out, and every now and again pawing with his fore feet; from this symptom one might fancy he was suffering from some bowel affection, but if he is forced to rise the true nature of the disease is very evident.

Treatment. The constitutional symptoms are best relieved by sedatives and purgatives; in all cases where the bowels are costive, we recommend a full dose of purgative medicine, and so long as the fever continues, it is advisable to give small doses of the tincture of aconite. The shoes should be removed and the feet enveloped in warm poultices, and bandages applied to the limbs as high as the knee or hock. The patient should be placed in a comfortable box or stall, and the body clothed according to the state of the temperature. If the patient lies down so much the better. Give pure cold water, a little at a time, but frequently, which is grateful to the sufferer, and it also appears to have a sedative effect. In exceptional cases where the pain is very severe, it may be considered desirable to administer an opiate. Bloodletting has been highly extolled in the treatment of laminitis, but we are of opinion that the disease can be successfully treated without resorting to bloodletting. Bleeding from the toe is often practised by farriers, and in the most of cases it is decidedly injurious from the irritation produced by cutting into the parts. When, however, effusion is suspected, the sole must be opened near to the toe, and the effusion allowed to escape.

Charcoal A Good Farm Medicine.

Nearly all sick horses and cows are made so in the first place by eating improper food, or too much of it. As soon as the owner finds any of his animals sick, it is the common custom to begin dosing medicine. "We musn't leave the animal to die; we must do something!" and so all manner of hurtful drugs and poisons are thrust down the throat—salt-petre, copperas, turpentine, etc., quite sufficient to make any well animal sick, or kill a sick one. "You didn't give the poor thing enough—you should have given it oftener—you can't expect your beast to get well if you don't do more for it!" Our rule has always been to give nothing unless we know exactly what to do; and in the meantime attend to every exterior comfort practicable. If the weather is cold, place it in warm quarters, avoid all exposure, and attend to pure air and strict cleanliness. But there is one medicine that can never do harm, and is commonly beneficial. This is pulverized charcoal. As we have just remarked, nearly all sick animals become so by improper eating, in the first place. Nine cases out of ten the digestion is wrong. Charcoal is the most efficient and rapid corrective. It will cure in a majority of cases, if properly administered. An example of its use. The hired man came in with the intelligence that one of the finest cows was very sick, and a kind neighbor proposed the usual drugs and poisons. The owner being ill, and unable to examine the cow, concluded that the trouble came from overeating, and ordered a teacupful of pulverized charcoal given in water. It was mixed, placed in a junk bottle, the head held upwards, and the water with its charcoal poured downwards. In five minutes improvement was visible, and in a few hours the animal was in the pasture quietly eating grass.

Another instance of equal success occurred with a young heifer which became badly bloated by eating green apples after a hard wind. The bloat was so severe that the sides were almost as hard as a barrel. The old remedy, saleratus, was tried for the purpose of correcting the acidity. But the attempt to put it down always caused coughing, and it did little good. Half a teacupful of fresh powdered charcoal was next given. In six hours all appearance of bloat had gone and the heifer was well.

We disapprove of quackery, where without a precise knowledge of the disease, powerful remedies are given at ramdom, indiscriminately. The objection of quackery cannot extend to the use of charcoal, for it can do no harm; and goes directly to the seat of the trouble in most sick animals, and if timely applied effects a cure.—*Live Stock Journal.*

Corn Injurious to Horses.

I may be too positive; but *I have carefully watched the effects of corn* upon the system of horses, until I am convinced that it is not only bad policy for owners in view of strength, health, and life of their horses, but that it is downright cruelty. I think the race is degenerating rapidly, and that we shall lose it entirely if we keep on many generations more. Compare the number of foundered horses to-day with those of fifty years ago, when in the country no one but the doctor "kept his horse up." Take into consideration the countless cases of colds, fevers, and like diseases among horses, and the incalculable number of foundered, broken down beasts, just when they ought to be the strongest and most serviceable, and must we not conclude there is some wide-spread and prominent cause? It is not all from over-driving; for we have many cases where family horses, receiving, as their owners suppose, the kindest care, shortly turn out to be broken-down beasts, from some unknown and mysterious cause. In regard to this disease: I believe corn which has been fed for years past has engendered heat and disease in the blood of horses, until they are keenly susceptible to the sudden changes of our climate, and that, and no other, is the cause of all this suffering and trouble. We have had a season of frequent and remarkable changes. The disease was in the blood, and ripe for development, and we have reaped the reward for past ignorance.

That horses should eat no corn at all I do not believe. A change of feed is desirable. As the cold winter comes on, I begin to prepare my horses for that event by mixing enough corn to keep them warm. Doubtless our winters are colder than the natural climate for our race of horses; and a little corn is beneficial in assisting their natures to resist the cold.

If any one wishes to learn the most natural food for a horse, let them try the experiment by turning the horse out to grass until all grain is out of his system, and then give him free access to all kinds, and see which he will choose. Ever after, let them have that as a staple. It will prove to be *oats.*—Murray Closson, *in "Our Dumb Animals."*

Scab in Sheep.

Mr. Henry Woods, steward and chief manager of the late Lord Walsingham, owner of one of the largest and choicest Southdown flocks in England, recommends for twenty sheep suffering with the scab, soft-soap, one and a quarter pounds; shag tobacco, one pound, spirits of turpentine, one pint; spirits of tar, one half-pint; white arsenic, three ounces. This to be safe and effectual must be boiled so as, thoroughly to dissolve the arsenic, and that he regards as an important point. Better put the tobacco when boiled into a flannel bag, and squeeze it sufficiently to get out all the strength, in order to get the full benefit of it. Then add water enough to make four quarts of the wash for each sheep. It is not a dip, but a wash, and to put it on, an old teapot or a spouted tin should be used. The way to make it most effectual is to open the wool by making three marks on each side of the sheep, also one down the shoulder, one on each side of the neck, one down the breast and one down each thigh and into the marks pour the liquid. In this as in many other things, if it is worth doing at all it is worth doing well, and so don't be in a hurry about it. Do the work well. Rub the liquid well into the skin. After passing it along the grooves work it well in with the hand. Be in no hurry about it as if you wanted to get over it as quickly as possible. The liquid will work a cure. There may be some spots where the liquid has not penetrated. Examine the sheep every two or three days for three weeks, by which time the disease may be expected to be eradicated. If there are any little white spots rub on some of the following ointment: Mercury, four ounces; Venice turpentine, three ounces; spirits of turpentine, one ounce. Let them be worked up and thoroughly mixed together, then add about one and one-quarter pounds of lard melted over a slow fire, stirring while melting. When taken off, continue to stir till cold so as to mix the mercury well.

REARING COLTS.—In rearing and breaking the colt, the law of kindness should not be forgotten. The first thing in breaking is to let the colt know that you are its friend, and this cannot be done too soon. Never allow the colt to get wild, but rather teach it to be glad to see you. When you have secured the full confidence of the colt, little breaking is needed; you only have to teach the colt what it must do. Patience and kindness will do this easier and better than any other course.

Poultry Yard.

Buff Cochins.

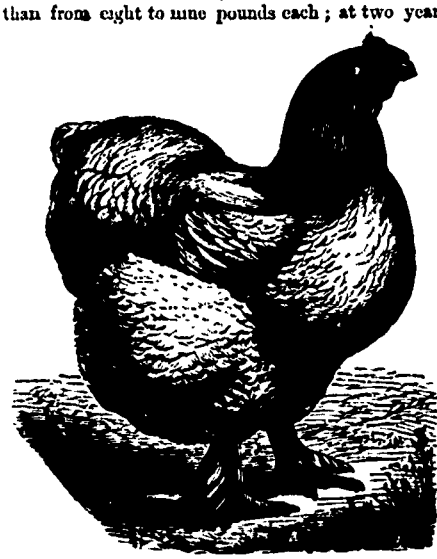
The introduction of the Cochin China fowl into our yards was a memorable event in the history of poultry, it undoubtedly awakened that startling "mania" which nothing has since been able to destroy, and which was calmly considered, one of the most curious phenomena of the nineteenth century. At the time of their appearance few people kept poultry, and there were no poultry shows; but the Cochins came like giants on the scene, and they conquered. Well therefore does he deserve the name universally bestowed upon him, "Father of the poultry fancy;" he is indeed a noble bird, and merits from us the best tribute of our respect.

Under the name of Buff Cochins we have several shades of color known as the Buff, Lemon-Buff, Yellow-Buff, and Silver-Buff. The LEMON-BUFF, is the most attractive in an exhibition pen; the neck, hackle, saddle, and wing and tail-coverts should be as near as possible the color of a new lemon; the breast-feathers and fluff, a pale buff or light cane color, flight-feathers of the wing also a pale buff or cane color, and perfectly free from any streaks or mealiness, the tail feathers should be light bronze or buff, rather darker in color than the breast feathers, the foot and leg feathering same color as breast, and free from any white or discolored feathers. The Lemon-Buff hen, should be a light cane color, uniform shade throughout; feet and leg feathers and tail should be same color; the hackle a light lemon, which is perhaps the most fashionable Color. BUFF,—The next most important color of cocks is the buff. The neck, saddle, hackle, and wing and tail coverts should be a bright dark orange; the breast and fluff rich yellow buff; the tail buff or dark bronze, free from any discolored feathers; the foot and leg feathering same color as breast, and free from any discolored feathers The hen should be of a rich buff throughout, with hackle rich orange. THE SILVER BUFF COCK, —A color not generally in much favor with competent judges at poultry shows, and therefore seldom seen, yet when true in color a very handsome bird The neck, saddle, hackle, and wing and tail coverts should be a light lemon, the breast and fluff a French white, the tail feathers light, tipped with orange or light bronze; foot and leg feathering same color as breast; flight-feathers of wing a pale buff or light cane color. The hen of this variety is a very beautiful bird when perfect in color. The neck and hackle should be a light golden lemon, the body French white, the tail and wing-flights a light buff or very pale cane color, leg and foot feathers same color as body

Having thus briefly described the different colors in both cocks and hens, we will now give the different points required in a high-class bird in each sex.

In a cock bird, size is a most important point to breed for. A full grown cock bird, say twelve months old, should not be less than from ten to twelve pounds. A Cochin increases in weight till three or four years old, and old cocks from two to three years old will increase to the weight of fourteen or fifteen pounds each, but good breeders maintain that a cock bird weighing twelve or thirteen pounds, when two years old is quite heavy enough, and shows in a pen to much greater advantage than a heavier bird. A very high class bird, with great depth of feather (a great feature in a Cochin), is very deceptive in weight, and we have very frequently seen cocks thick, heavy looking birds, full of feather, weigh much lighter than a close-feathered bird, that in a pen does not look so heavy by pounds. Close-feathered birds are objectionable. The head should be long, not too thick or coarse, the beak rich yellow, the comb perfectly upright, not too large, and evenly serrated, the ear lobes prominent and red, the wattles deep, the neck well arched, not too short, and not carried too much back, the shoulders broad and square, and well carried up; the breast full, and broad as possible; the legs set well apart, the more bone and thickness the better, not too long, nor either too short; feet large;

toes thick, long and straight; legs and feet well feathered, and free from any long hock-feathers; the wing small, carried well up, and close, the ends of the flight-feathers closely clipping the sides, so as to be almost invisible. Twisted flight-feathers in the wing, or any of the long flight-feathers not carried well under, are very objectionable. The tail should be as small as possible, free from any long sickle-feathers, and resembling much the style of a plume of feathers. In the Cochin hen, also, size is a most important point, for, however good in quality and color, if undersized they are of little use. Hens live to a greater age than cocks, and Cochins increase in weight every year, their weight is much heavier in proportion to the cocks. Hens at one year old should not be less than from eight to nine pounds each; at two years



old they will increase in weight to ten or eleven pounds each, and at three or four years old they will weigh nearly twelve pounds each: but hens ten poundseach at two years old are a good average weight, and quite heavy enough. The head should be long, not too thick or coarse; the comb fine, upright, and not too large; breast broad, prominent and full; shoulders broad and square; the wing small, the under flight-feathers carried well under, and the outer-flight-feathers closely clipping the sides; the legs thick as possible, and a good bright yellow, well feathered, and quite free from any long hock-feathers. The most important point in a Cochin hen is the cushion; in a very high class hen the cushion should be very large and prominent, forming quite a ball on the rump, and hiding the whole of the tail with the exception of the ends of the longest feathers.

In mating Buff-Cochins for breeding, the stock birds should be as free from faults as possible, little faults in parent birds develop themselves on a much larger scale in the young stock. Cocks as a general thing most resemble their sire and pullets the hen. Amateurs who wish to breed Cochins should not be guided in their purchase by the awards of judges at the different poultry shows, and purchase the prize birds for stock purposes. It is well known that some of our judges have but little real knowledge of the birds they judge, and it not unfrequently happens that some of the best birds are passed over unnoticed. And we have excellent authority for stating that some of the first prize exhibition birds at Birmingham, the hens had not laid an egg for years, and the cock-birds were useless for breeding purposes. Hens for the stock pen should be from one year old and not over two years; large, square, heavily feathered birds, rich buff in color, and not too light, and quite free from any mixture of shades in the color of feathers, but a decided color throughout; plenty of width between the legs is a very important point; legs as thick as possible, and a good yellow. The larger the hen is in cushion behind, and more prominent her good points, the better; a flat packed hen, with no rump, however beautiful in color and good in other points should not be placed in a breeding pen. The ear lobes should be free from white streaks, comb as small, fine, and upright as possible; feet, large, and well feathered; toes thick, long and straight. The cock bird to run with these hens should also be a rich buff, a good sound color throughout; great care should be taken in not having the under flight-feathers of wing *white or mealy*, black is not objectionable, but a good rich buff is to be preferred; but if white or mealy it is sure to produce mealy-flighted cocks. The wing should be as small as possible, well carried up, and closely tucked into the side; a large, long, loose winged bird scarcely ever carries his wing close and is very objectionable for stock purposes. The cock should not be too large, if possessed of all the good points mentioned, a bird ten or eleven pounds at twelve months old is large enough, and a two-year-old bird not over eleven pounds is preferred by good breeders. The strongest chickens are produced from hens two years old and cocks one year old. In the early days of Cochins most of the hens had pencilled hackles, but now-a-days such birds would be passed over by good judges without recognition. Hens should resemble the cock in shape and carriage as much as possible.

DO NOT SCALD POULTRY.—The practice of scalding poultry before plucking it, has very properly been vetoed by market dealers. Fowls may be plucked with equal facility and with better effect in preserving the flesh, immediately after death, and before they have had time to cool.

FOWLS EATING FEATHERS.—Some fowls acquire the habit of picking and eating their feathers from being deprived of animal food. Fowls are omnivorous feeders and require such food. In the summer when they have their liberty, they can usually supply themselves; but in winter this is more difficult. Give them fresh meat, or offal chopped fine, or livers; this last is particularly grateful to fowls. They often acquire the habit from picking each other, during the moulting season; and in this way may learn it from each other. If a fresh meat diet does not break them of the habit, fatten and kill those addicted to it.

CARE OF YOUNG DUCKS.—I take three board; about a foot wide, and make a yard either square or triangular shaped, and put the hen and coop in one corner of it. I keep the hen coop until the ducklings are about two weeks old, when I give her her liberty. She will stay with the ducklings some time longer. No more than twelve or fourteen ducklings should be kept in one yard, as they are apt to pile upon one another at night, and smother each other. The ducklings should be confined in a yard until they are well feathered, for if they go through wet grass they almost invariably die. The yard should be moved every two weeks and care should be taken to have a good shelter in one corner.—*Poultry World.*

Preparing Poultry for Market.

Before being killed, all fowls should be fasted for at least fourteen hours. Among the methods of killing usually had recourse to, M. Soyer recommends breaking the neck; which is done by taking the head in the right hand, with the thumb against the back of it; seizing the neck with the left, the same arm supporting the fowl; then a quick jerk with the right hand, turning the thumb downwards at the same time, separating the vertebræ—but it takes a rather a strong arm to do it. Countrymen and many others attain the same object by taking the head in the right hand and swinging the fowl round by it. One swing, properly done, will dislocate the spine. Another method is to strike a sharp blow on the back of the neck with a stick. But any of these methods may cause much needless suffering in unskilful hands. It is true there is no "instantaneous" method of killing a fowl, the tenacity of life being very great; but the actual operation should be only momentary; and we strongly advise all inexperienced amateurs to make sure of the matter by laying the neck on a block and chopping off the head at a blow. What we have said as to the tenacity of life may be illustrated by saying that even after this capital operation, the bird, if left to itself, will struggle violently all over the yard; but this can, perhaps, hardly be called life in the true sense, and we may hope there is little or no conscious pain. The fowl should of course be first bandaged, to prevent struggling; and, indeed, this ought to be done in all cases where the knife is employed, afterwards hanging up by the feet to bleed freely. When the head is cut off, the skin should afterwards be drawn nearly over the stump and tied.

Poultry should be plucked or picked whilst warm, when the feathers will be removed with much less difficulty. Fowls are generally picked quite clean, but it looks better in the case of young chickens to leave a few feathers about the tail. They will eat best if nothing further is done to them; but it improves the appearance greatly for market to plunge the carcass, immediately after plucking, into a vessel of boiling water for a few moments which will "plump" it a great deal, and make the skin look bright and clean. After scalding, turkeys and fowls should be hung by the legs, and waterfowls by the neck. For sending to market wholesale, they should not be drawn, as they will keep much better without, and this is the proper business of the retailer; but in selling for consumption, the bird should be properly prepared for table. It may not be out of place to remark, that if after drawing, the cavity be filled with charcoal broken in small pieces, the fowl may be kept sweet a considerable time.—*Wright's Illustrated Book of Poultry.*

Feeding Different Breeds of Fowls.

The feeding qualities of different breeds of fowls, as compared with each other have been but little experimented upon. There is, undoubtedly, as much difference in poultry in this respect as in farm animals. *Field and Factory* contains an article on poultry raising, in which we find the results of feeding several different breeds, the experiment having been instituted last year:

Ten pullets each, of five breeds, each within a week of being six months old, were placed in yards forty feet square, with comfortable houses. For the next six months an account was kept of their food, and eggs produced, with the following results:

The Dark Brahmas ate 369 1-2 quarts of corn, oats, and wheat screenings, laid 605, eggs, and weighed 70 pounds; feed cost $5 77; eggs sold for $10 68; profit $4 31. The Buff Cochins ate 406 quarts, laid 591 eggs, and weighed 73 pounds; feed, $6 34; eggs, $9 54; profit, $3 51. The Gray Dorkings, ate 300 quarts, laid 424 eggs, and weighed 59 1-2 pounds; feed, $4 87; eggs, $8 73; profit, $3 86. The Houdans, ate 214 quarts, laid 783 eggs, and weighed 45 1 4 pounds; feed, $3 35; eggs, $13 05; profit, $9 70. The Leghorns ate 231 1-2 quarts, laid 807 eggs, and weighed 36 1-2 pounds; feed, $3 62; eggs, $13 55; profit, $9 83.

The reader can easily figure for himself the relative value of the different breeds in this case from the results obtained.

The Carrier Pigeon.

Under the name of Carrier pigeons, several very distinct varieties are commonly confounded together. The Carrier, as applied to pigeons, evidently was first employed to signify those breeds that were used to convey or carry messages to their own homes from distant places. In the process of time it has been used by English fanciers to signify a very artificial or high-class breed, the birds of which are never employed for carrying messages, but are valued solely in proportion to the perfection of certain "properties" that they possess. This is an unfortunate circumstance, for by the public at large the term Carrier is always taken to express the fact that the birds to which it is applied are really those employed to "carry" messages; whereas the long distance-flying birds, those known more correctly as "Homing" birds, are totally distinct. The Carrier of which we now treat, is a cultivated specimen, raised to its present standard of excellence solely and specially for the show pen. Its homing faculties, powers of flight, or aerial performances, are quite ignored in the desire and endeavor to obtain properties more gratifying to the eye of the breeders, than merely to satisfy the speculative object of our fellow fanciers of the flying fraternity. It is well known that the nearer the Carriers approach to perfection, as exhibition birds, the more useless do they become as flyers; in fact, for the transmission of news, they are worthless. The Carrier of our day is not a flyer, and are rarely ever allowed to go beyond the prescribed boundary of their loft or aviary.

The members of the National Columbarian Society of England drew up a most elaborate and valuable paper on the properties of the Carrier, and Mr. Tegetmeir in his pigeon book, quoting from it thus describes them. 1, "THE SKULL. It should be long, straight, narrow between the eyes, and flat at the top, where it is sometimes dented. 2, THE BEAK. The upper and lower mandibles should be long, straight, thick, and boxed, that is to say, the upper should close on the lower like the lid of a box. The color of the beak is not regarded as material. 3, THE BEAK WATTLE. The wattle of the beak should be distinct from that of the eye, soft in texture, short from back to front, broad, tilting forwards from the forehead, and pointed at its termination towards the tip of the beak on the top. It should not present a flattened appearance, but stand out like the surface of a cauliflower, and its fissures should curve somewhat regularly towards the point; this upper wattle should be met by a corresponding one (sometimes called the jewing) on the lower jaw. 4, THE EYE. The eye-wattle should be large, fleshy, soft, round, regular, and should rise above the skull; the ball of the eye should be prominent, like a well set jewel, its iris fiery red, or it may be pearl-colored in dun-colored birds. In white Carriers the eye should be black, dark. 5, THE CARRIAGE. The beak and head should form nearly a right angle with the neck; the shoulders should be broad, the chest full, the limbs long, so as to keep the body well raised from the ground; the bird should show his carriage without requiring much rousing, holding the neck slightly curved over the back, so that the eye is directly over the toes. The body should present a graceful line from the shoulder to the end of the flight, the back being flat, and the tail and flight-feathers touching, so as to render the line continuous. The neck should be long and thin from its commencement at the shoulders upwards, the head being well undercut at the junction of the lower jaw with the neck. 6, THE PLUMAGE. The feathers should be dense and closely set, a Carrier in perfect condition appearing as if cut out of stone; the colors should be a deep black, a dark dun, a good bright blue, with well defined black bars across the wings and tail, or a pure white."

To breed Carriers to a high degree of perfection, great care must be taken in pairing the birds, so that the deficiency of one parent may be counteracted by the good properties of the other; and two birds showing a tendency to the same defect should never be mated together. Never pair two *Duns*, and seldom two *Blacks*, if it can be helped. *Blues*, as a rule, are always mated with blues or silvers. Two Duns will often throw birds very light in color. A Dun should be a sound, even colored dark, but in this climate the sun plays sad havoc with plumage. To keep the Dun color, dark Duns and Black should be paired and you thus get good Blacks and good Duns. A Black should be a sooty black, not with a blue, dull tinge but like a raven. Carriers are good breeders and moderately good feeders, but in order to make the most of them, plenty of space must be at their disposal, and (where practicable) a separate pen for each pair should be given so as to secure success in breeding, and also to prevent spoilation of the birds through fighting. A dry and moderate warm room or loft, sheltered from the north and north-east winds is suitable, and may (according to its dimensions) be arranged into fair divisions to suit the number of birds to be placed therein, giving to each pair a flying range of five or six feet high from the floor. A shelf in the interior, and free access besides to the common outer airing-pen, where clean fresh water and a hopper well supplied with food should be always kept for them. If especial care is not begrudged, and ample space is at command (should the birds be unusually pugnacious), it would be better for a separate "hopper" and water fountain, etc., to be placed within the pen for the sole use of each pair. Arrange a bath for their occasional use, and when filled guard against a battle royal therein. A sprinkling of salt *occasionally* is advisable, but care must be exercised as to where it is placed, or an encounter will take place over the coveted relish. In all fittings and arrangements it is necessary that great precaution against a struggle should be taken, for it is essential that peace should reign within the castle of the "King of Pigeons."

For the rearing of young Carriers there should be kept a sufficient number of big, strong, hardy *long-headed* common birds, as foster parents; short faced birds won't do for in feeding they are apt to crook or bend the pliable beak of the young, entrusted to them Upon these foster parents should devolve the raising of the Carrier from say nine days to a fortnight old. These feeders should have entire liberty and also a full hopper and pure water at disposal. By this system of transferring young from valuable common stock, immense advantages will be derived. More young will be raised thereby without injury to the parent stock, which may thus be kept throughout the breeding season moderately free from vermin, and from dirt, and in perfect showing condition.

The entries for the forthcoming show of poultry, pigeons, and dogs, at Wolverhampton, England, are as follows:—Poultry, 670; pigeons, 120; dogs, 360; total, 1150. Those in the poultry classes shew a falling off of 100 birds when compared with last year. The dogs will constitute the chief feature, and in it there are 80 more entries than in 1872.

Advertisements.

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