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# THE CANADA FARMER.

VOL. XIII.—No. 9. PUBLISHED MONTHLY. } TORONTO, CANADA, SEPTEMBER 15, 1876. { $1.00 Per Annum. SINGLE COPIES TEN CENTS.

## Agriculture.

### Smut in Wheat.

It is now a well understood thing that seed-wheat must be pickled in vitriol in order to destroy the vitality of the smut-germs. This smut is a fungus of the genus *Uredo* and the one infesting wheat is *Uredo caries*. The germs are present in the seed when sown, and they grow as the plant matures, rendering the flour made from a crop in which smut is present very offensive and often unfit for use.

A good pickle in which to soak seed wheat is made by dissolving a peck or coarse salt in 20 gallons of water and adding thereto one pound of blue vitriol, sulphate of copper. The seeds which float should be taken off and destroyed. It is scarcely necessary to impress upon farmers the necessity of pickling their seed, but the following from the pen of a noted Scottish Agriculturist is so conclusive as to the benefits of the process that we reproduce it:—

"I have long been of opinion that ball-smut is a fungus propagated by adhering to the seed, and unless this fungus is destroyed before being sown, all the grains infected by it will be sure to produce diseased ears. Smut is of two kinds. In one of them the smut or black powder flies or wastes away before the sound wheat becomes ripe, while in the other the powder is enclosed in a skin frequently strong enough to remain unbroken when passing through the threshing machine. The larger number of balls, however, do get broken, the powder discoloring the sample giving it a disagreeable smell and a peculiar oily feeling. It is this variety which is destroyed by pickling. The other appears to be propagated in some other way; at least, as yet no remedy has been found for checking it. Many years ago I rubbed smut balls among clean wheat, then pickled part, and sowed both. The result was, the pickled seed produced a healthy crop, while of the unpickled portion there was hardly one sound ear. I have again and again seen the sowing of fields finished with unpickled seed tell to the spot where the dressed and undressed seed met. Old wheat should not be pickled, as its vitality will be sometimes totally destroyed by it, and the fungus itself seems incapable of growth when upwards of twelve months old. I am far from saying that ball invariably follows when undressed wheat is used for seed, as by a careful selection of seed this may be avoided for years. But the little trouble and expense saved by not pickling seed is trifling indeed in comparison to the security given. I have tried pickling barley for blackheads, where the powder blows off before the grain is ripe, but, as in wheat, without success. Still, I think it is worthy of further trial, as it has appeared to me for the last two or three years that many of the blackheads in both oats and barley are more nearly allied than formerly to the true ball in wheat. I should like to see experiments made by steeping grain different lengths of time in sea water, or in water salted to the strength of swimming an egg. This is said to be a remedy against mildew and rust in warm climates, and possibly it may prove equally efficacious in Scotland."

### Cleaning Drains.

It frequently happens to land drains, says a German agricultural paper, that they get stopped up with accumulated earth, which makes them useless. How can it easily be taken away? In all systems of draining, pits should be made for testing the drains, in which the earth carried by the water can accumulate. When a drain has to be cleaned out, the augur is pushed down into the pit and left there. The flowing off will thus be hindered, and it happens that as long as there is a full flow of water, that it will be dammed up until the pipes have filled them. These earthen pipes or wooden boxes are sunk a few inches below the level of the drain, as is shown in the picture. These are covered over so as to hinder anything that could stop up the drain, getting into it. The drain delivers into the box one side, and comes out on the opposite side. In order to remove the accumulated earth from these boxes or pits, it is necessary, as shown in fig. 1, to use a sand pump, as it may be called, an implement which, being

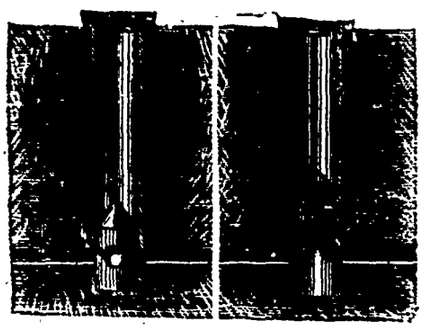


Fig. 1.—For Flushing Drains.

turned round, fills itself with sand or mud, and then is taken up. If such a quantity be accumulated as to cause a strong current, then the dam can be removed, a rapid flow follows in the drain, and by that the mud is washed away to the mouth of the pit. There are various ways of stopping the flow of water in drains for this purpose. With square wooden boxes wooden blocks can be used, as in fig. 1, and if the pits are round, a round block can be fixed in them, and it works like a tap, which can be opened or shut, as in fig. 2., or the dam can be lifted or sunk, as shown in fig. 1, thereby either stopping the current or letting it flow.

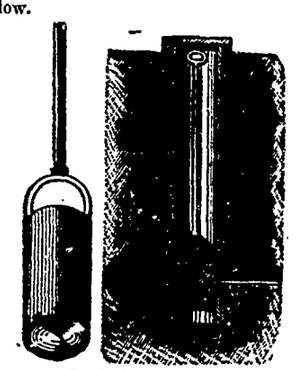


Fig 2. Drain Cleaner.

### Leaves from Farming Experience.—No. 12.

#### Dairy Farming.

If you churn too long, some cheese may be mixed with the butter and spoil it. When you stop the churn, put in some cold water to cool the butter. Take it out at once into a vessel for the purpose. If you wash it in water, see that the water is free of lime or it will spoil the butter. Most of the lime may be removed from water by boiling and cooling again. Then keep out the sediment. Some of the best butter makers use no water, only work the butter gently with the hand, cooling it in water and squeezing it with a fluted roller until all the milk is got out. Then take half an ounce of the purest salt, and mix it well with every pound of butter. Put it in a vessel so that it may drain. Cover with thick cotton cloth wetted and doubled, until next day. Let as little air to it as possible. Take it next day, and add another half or quarter ounce of salt and a quarter ounce of good sugar. Mix well, then prepare for market in prints, rolls, tubs or firkins.

For transport the firkins should be better made than they often are, of close-grained hardwood, that will not let the brine through the pores nor taste the butter. Firkins should be soaked with soft water and soda, to salt the wood and remove the acid of the wood. There is too much water left in the butter, and much of that water escapes either by evaporation or leakage. The butter shrinks, leaving an empty space between the butter and the vessel. Oxygen acts on the butter and it is spoiled. Some press their butter with dry linen cloth, and put sponge in a towel and press it, to remove as much water as they can. The atmosphere acts the same way on barrelled pork, and rusts it, and it is only fit for the soap-maker.

When the best salt cannot be got, the magnesia and lime may be taken out of common salt by grinding it with a bottle, and to about eighteen or twenty lbs. of salt add two quarts of boiling water. Stir it occasionally about an hour, strain and dry the salt for use. The salt left will be free from lime or magnesia and may be hung in a bag to dry for use, for butter or cheese.

The salting of butter causes it to shrink, and water is pressed out, which makes it advisable to have it salted twenty-four hours before being packed. Press as close in the tub as you can, and keep it from the air as much as you can, as the oxygen of the atmosphere is an agent by which the fatty matters of butter are liable to be brought into a state of decomposition. Therefore, it should be excluded as carefully as possible.

#### Growing Beef.

Another way of using farm produce is feeding for beef. cattle, mostly of your own raising, to be sold when about two years old. When the right method is taken, with the right stock, a steer or heifer may be made to weigh from 1200 to 1400 pounds, at two years old, which will pay. An Ayrshire cow, about 1100 pounds weight, was fed with thirty pounds of hay and nine pounds crushed barley daily, and gave thirteen quarts imperial of milk and added three pounds daily to her weight.

#### Correction.

I have tried to show you the necessity of sufficient manures for success in working a farm. There is too little charged for rent. I charged $900, whereas it should be $1200—rent which will leave about $5700 yearly to the farmer for his remuneration, and loss of stock if any; only the outside of the farm will need fencing, and a little portable fencing for the young heifers.

#### Special Manures.

You will observe that I do not use so much of special manure as is recommended in books, but I use it every year in about such quantities as I calculate useful. Four bushels of lime will be nearly all removed in one year's clover. An average of crops will remove 116 lbs. Common salt supplies soda, potash, and the chlorides; plaster supplies sulphuric acid and lime. Superphosphate of lime supplies sulphuric acid, phosphoric acid and lime. Alum supplies potash; and alumina for sandy soils clay does not need it. Ammonia is useful for full crops; from 20 to 50 lbs. per acre, mixed with plaster 50 lbs, and 50 lbs. ammonia, with salt 100 lbs. and 50 lbs. superphosphate has added near 20 bushels of wheat of 62 lbs. per acre. Any person using one or two of these substances may receive no benefit, but use them all as directed for one rotation of 9 years, and you will be satisfied, but, until a field has got 18 loads of yard manure, each acre, it will need 3 times the amount of top-dressing that is directed to be applied after full manuring.

#### Conclusion.

I wrote these papers with the design of telling my grandsons how I brought my farm into such a good state of cultivation, and how they may make it better, and I have had many questions put to me such as, why are our crops not so abundant as formerly; what to do to restore

fertility; if dairying is profitable; also whether cheese or butter making pays best; and about stall feeding. And it is with the view of answering these questions, that I have written the foregoing. There is no speculation in this report of farming. All has been done as stated continuously ten or twelve years. It would be difficult to use our land worse than we do in Canada. We are in the same state that Scotland was in 150 years ago. I was acquainted with the state of farming in Scotland from Stirling to Arbroath in 1810, and it was much better farmed than Canada is at present from Montreal to Kingston. And the grain as sold in market was very clean. Grain is very far from being clean, especially oats, in this district. And we have far better and cheaper tools to do the work with. All kinds of manure can be got at moderate prices, and better still, there is much information given by papers and other publications daily and monthly, to all, if they would only use it. I have seen more sound information in one number of the CANADA FARMER than I saw the first forty years of my life. The evil may cure itself, as many farmers must leave their farms unless they raise and sell more than is done at present.

JOHN ROBERTSON.

Bell's Corners, Ont.

## The Prickly Comfrey.

To the information already given respecting this promising forage-plant, we have more to add. According to the *Agricultural Economist*, Mr. D. R. Scratton, one of the council of the Agricultural and Horticultural Association, has had the leaves and root of this plant analysed by Professor Sibson. The following is the analysis and report.

| | |
|---|---|
| Water | 84·21 |
| *Nitrogeneous compounds | 2·51 |
| Dizestible Carbonaceous principles | 4·15 |
| Woody Fibre | 2·03 |
| †Mineral matters | 2·09 |
| | 100·00 |

| | |
|---|---|
| *Containing nitrogen | 0.37 |
| †Containing phosphate of lime | 0.40 |
| " carbonate of lime | 0.63 |
| " potash | 0.74 |

General composition of root:—

| | |
|---|---|
| Water | $2.20 |
| Dry substance (organic) | 16.02 |
| Mineral matter | 1.78 |
| | 100 00 |

I have the pleasure of reporting on the results of my examination of the samples of Prickly Comfrey received from you a few days since. The water was determined from the fresh plant marked "Association plant," and the analysis made of the leaves sent by Mr. Scratton, after drying. A general examination of the root appeared to me sufficient. You will notice that the per centage of mineral matter is large, and it would therefore be likely to be an exhaustive crop; hence a proportionately rich manure would be required for it. Judged by this sample, it would appear to be a forage-plant of fair feeding value, but I should doubt whether our average summers are sufficiently moist for its successful cultivation. (Signed)

ALFRED SIBSON.

Mr. Scratton has received the subjoined two letters from gentlemen growing the plant, the first in Essex, the second in Cornwall:—

COGGESHALL, March 20th, 1876.

RESPECTED FRIEND,—I have paid considerable attention to *Symphytum Asperrimum* for the last four years. My experience is that it bears cutting well four times a year without any injury to the plant. The crowns are not easily injured even if a wheel passes over them; but as we have the rows three feet apart this can be avoided, and cultivation is most easy. It will bear folding with sheep well, but as the plant will be about three feet high when coming into bloom (the proper time for feeding or cutting) they are apt to trample some of it down. If it could be arranged for them to feed through the hurdles they bite it off close without waste. I have generally cut it. Most animals take to it at once. I bought a few lambs last year to try it; they took to it at once, and did well with a little corn. Pigs also fat well with it, with bean meal or peas, they are extremely fond of it. I always manure mine well when planting with farm yard manure. I will not want any more for some years. I shall be quite pleased to show thee what I have growing at the time of the Agricultural Show. But I have so many customers for my roots amongst my friends that my stock is becoming small.—Thine sincerely,

WADEBRIDGE, CORNWALL, March 24th, 1876.

SIR,—In answer to yours of the 18th inst. respecting the *Symphytum Asperrimum*, I have grown for it for some time, and am so much pleased with it that I have increased my tillage. It is an excellent food for cattle. I give it to my horses, cows, and pigs. They are excessively fond of it, and if the wheels are broad, no great injury is done to the root in removing the crop from the ground. Last year the plant was cut five times, and I believe I had nearer 100 tons than 80 to the acre. This year I have ordered my men not to cut but to pluck the largest leaves, and I believe it will yield nearly 20 tons an acre more. The roots will pay for being well dressed. It is very gelatinous, and my horses do their journeys better on it than on any other green food. Yours, &c.

D. R. SCRATTON, Esq.

Lieut.-Col. Chichester, of Runnamoat Co., Roscommon, says that he has grown Comfrey for some years past on deep but well-drained peat soil, where it grows with great luxuriance. He now contemplates growing it extensively both on peat and clay soil.

The *Banffshire Journal* says:—"In passing through Grange the other day, we called at the farm of Floors. Mr. Gray has a garden always well worth a visit, and specially so this season, as many rare and beautiful flowers are being yearly added to it; but the feature of all others which struck us most in the way of rarities was a plant that, while being a rarity in our quarter, will, we have no doubt, soon be a favourite for its utility. We refer to a vegetable known as Prickly Comfrey. Mr. Gray has had a long strip of his garden laid out with this plant during the past season, and it is repaying his trouble well. The vegetable is used entirely for feeding purposes, and is greedily devoured by horses, cattle, sheep, or pigs; but its principal value lies in the fact that, during one season you may have twenty crops. The enterprising farmer who has introduced it has already this season had five crops, and expects as much before the season is out. The plants, being young, have not come to grow so rapidly as they will do. The blade, which is nearly the size of an ordinary cabbage, when taken into the mouth, has an oily taste not unlike oilcake, and from its nature must be very fattening and any farmer having a few acres of this crop growing would find it a great addition to his means of feeding any kind of stock."

It will be observed that the principal objections to the *Symphytum* are that it is probably an exhaustive crop. We are inclined to think this is not a serious objection. As the plant would not be allowed to mature its seeds, it would not remove much of the mineral salts from the soil. Its broad leaves would have drawn their principal sustenance from the air. The second objection is that it is doubted if it will stand a hot, dry summer. Of course, experience only could settle this point. We should judge from the appearance presented by the roots that the *Symphytum* could stand a drouth reasonably well.

## The Wheat Midge.

At a late meeting of the Farmers' Club of the American Institute, a letter from a wheat grower of Niagara county, New York, was read as follows:

The question is frequently asked, what is the reason that the wheat midge has destroyed a smaller proportion of the wheat crop during a few years past than they did a number of years ago? The usual answer to this question is that farmers put it in well and in good seasons. This is all true so far as it goes, but, in my opinion, it does not cover the whole ground. One of the principal reasons why the midge has destroyed but little wheat during the last two years may be found in the fact that we have had early seasons; that not only wheat, but, as a general thing, all other crops have been much earlier than they have been for some years before, so that wheat, by heading out some two weeks or more earlier than for some years before, got the start of the midge, and, where other things were favorable, made a fine crop. The influence of different seasons in favoring or preventing the operation of the midge may, perhaps, be better understood by referring to the manner in which they first made their appearance and commenced the destruction of wheat in this vicinity. They were first found in a few late heads near the fences, but not early enough, nor enough of them to do much damage. The next year they were a little earlier and more of them, and so continuing to make their appearance earlier and to destroy more and more each year, until there was but very little wheat that escaped their ravages, and the prevailing opinion in this section seemed to be that we would have to stop raising wheat. But what now seems to be generally forgotten is the fact that while the midge was the most destructive, we had very late seasons; that wheat was not ready to harvest until nearly or quite the first of August, and that we were able to raise but very little wheat until the season changed, and wheat headed out some two weeks or more earlier than it had for several years before. Nor does the fact seem to be very generally considered and understood that the change two years ago was a gradual one. Instead of a moderate change of a few days each year, which the hedge would be likely to keep pace with, the season in 1858 was some two weeks or more earlier than it had been for some years before, and that this, together with the fact that last season was a little earlier than the previous year, and that this season has been a few days earlier than the last, accounts for the continued good crops of wheat that have been grown, notwithstanding the midge has made its appearance a few days earlier each year. It will be well for wheat growers in midge-infested sections to remember that no one can tell how soon a change in the seasons may expose their wheat to destruction. My judgment is that it is better policy for the farmer not to sow wheat very extensively, but by giving a good chance, and cultivating and manuring well what he does sow, raise heavy crops. Another advantage in this course is, that good, heavy wheat is almost always earlier and less liable to be injured by the midge than a poor crop. Should we, sooner or later, as most likely we shall, have late adverse seasons in which the midge may be destructive, there will be a great deal less loss in labor, seed, and the use of the land, than there would be were farmers to return to their old practice of making wheat their main dependence.

J. W. Chambers said: During a number of years past the wheat midge has scarcely made an appearance in the wheat producing regions of our country. The conjecture is that the ravages of this pest were prevented by some ichneumon fly. Should the midge ever again attack the growing wheat, the most effectual way to battle with this enemy is to discontinue raising wheat for a few seasons.

## A Farm Fence.

A correspondent of the Detroit *Tribune* gives the following information in regard to a cheap farm fence. He writes: "I have to day completed 100 rods of post and board fence, which I am so well satisfied with that I venture to tell your readers how I proceeded. It is rather an experiment with me but so far I am of the opinion that I shall erect all my fences on the same plan hereafter.

I should not have built this fence now if I had not been obliged to wait for the corn to harden sufficiently to enable me to crib it safely, and while waiting concluded to put up this strip of fence, which was put down for next spring. The late rains favored setting the posts by making the ground moist. I had secured split oak posts at a cost of ten cents, delivered. These were sharpened, and I calculate that the chips and hewings pay for this work. After the posts were sharpened and placed on the line of the proposed fence, stakes were set firmly on the line, fifty feet apart, and two lines drawn, one at the bottom and the other at the top of the posts. With a nine-feet measure we proceeded to lay off the places for the posts, sticking down pegs a foot long. With a sharp spade a hand followed and took off the sod, and also removed the earth one spade deep. I followed with an iron bar, round and sharp at the lower end, but enlarged upward until, fifteen inches from the point, it is four inches in diameter. With this instrument a man may make the holes very rapidly. After making the holes for five or six rods we set the posts. A strong bench was made about the height of a common table, having a cleat nailed to the legs on each side for a step. Armed with a beatle one man mounted this bench while the other held the post, and it was sent to its abiding place quicker than I can describe the operation. The driver dropped his beetle on to the bench, stepped to the ground, and in a twinkling he was ready at the next place. The posts are set in this way very rapidly and very firmly in the ground. After driving them the earth is replaced, or the space dug out with a spade and filled in with small stones, which is a better plan, and trampled firm. We then proceeded to nail on the boards which are eighteen feet long. The first board is nailed on a foot from the ground, the second six inches above, the third ten inches above that, and the fourth twelve inches above the third. This makes a fence four feet four inches high. After the boards were all on, the posts were sawed off at the top of the last board, and two furrows on each side turned to the fence, which closes up the space below the bottom board. I cannot give you the exact cost of this fence, for it was put up at odd spells and by parts of days—in the way a good deal of the work on a farm is done; but I consider it a cheap fence and a good one. I prefer it to hedges."

## The Wire-Worm.

Edward Mason writes in the *Germantown Telegraph*.—As the wire-worm works beneath the surface of the soil, and is seldom seen unless when the soil is disturbed by the plough, &c., its destructive work is often attributed to the cut-worm or some other insect. Wire-worms are the larvæ of that tribe of insects known as *elaterida*, or click-beetles, from a noise they make when springing into the air, in an attempt to recover their natural position, when they happen to fall on their backs, which they frequently do when dropping from plants to the ground. Upwards of sixty different varieties of these insects have been discovered by naturalists, several of which feed on our valuable cultivated crops. They do not confine themselves to any particular kind of food, but attack indiscriminately the

roots of the cereals and grasses, as well as esculent roots of every kind in the field or garden. They are injurious to all plants of the *brassica*, or cabbage family, and also to garden flowers.

It is said that whatever grass will grow, wire-worms will live on. The eggs of the parent beetle are supposed to be deposited on the roots of grass and weeds, but this point has not been clearly determined. The eggs must be very small, for when first hatched the larvæ can scarcely be detected by the naked eye. They live five years in the larval state, casting their skins several times, and committing great ravages on nearly all kinds of plants. When fully grown, the wire-worm forms a shell in the earth, in which it becomes a pupa or chrysalis, generally in July or August. This pupa remains stationary, quiescent and harmless for about three weeks, and then changes to an *elater* or beetle, which is at first white and tender, but in a short time gains its proper color and hardness. These beetles run with the heads down, and drop when apprehended. They fly well and are perfectly harmless, feeding only on flowers. The extent of the damage done by the wire-worm during its five years of larval life may be estimated from the fact that a single worm has been observed to bite from fifteen to twenty plants in a short time.

When fields lie fallow the wire-worms feed on the grass and weeds, which are too frequently allowed to over-run them; whereas, if the soil was kept clean, they would either die for want of food or be compelled to move to some other place. As these larvæ invariably lie beneath the surface of the soil, every plan suggested for their destruction must be founded on this consideration. Superficial applications have been frequently tried without effect. The most obvious remedy is to saturate the soil with some fluid that will destroy them, or top-dress the surface with some substance that, when dissolved by rain and carried into the soil, will be destructive to them without damaging the plants. In a fallow field no precaution need be used, as the destruction of weeds and insects are indispensable. A farmer of the island of Guernsey, whose crops were entirely destroyed by wire-worms, used a top-dressing of salt, lime, and soot, but it did not check their ravages. He was then advised to try guano; he did so, and found that it checked their progress as soon as applied, and banished them from his fields.

Sir Joseph Banks suggested a plan for alluring wire-worms from plants, and collecting them that they might be destroyed. This consisted in placing slices of raw potato on skewers and burying them in the ground near the seed sown. This appears better adapted for the garden than the field. A farmer in England affirms that he has frequently freed fields entirely from wire-worms by sowing a crop of white mustard seed. The experiment he tried so frequently and in circumstances so well calculated to demonstrate its effects, that he is perfectly satisfied the remedy is efficient. "Encouraged," he says, "by the results of my former trials, I sowed a whole field of 42 acres, which had never repaid me for nineteen years, in consequence of every crop being destroyed by the wire-worm, and I am warranted in saying that not a single wire-worm could be found the following year; and the succeeding crop of wheat was the best I had reaped for twenty-one years." It has been found by repeated experiments that soda-ash will destroy them when applied as a top-dressing at the rate of two hundred pounds per acre. Refuse gas-lime from gas works, will also banish the wire-worm from all places to which it is applied.

## Analysis of Millet and Hungarian.

Dr Sturtevant gives the *Scientific Farmer* a valuable article about Hungarian and its effects in the soil, in the way of exhaustion. He compares it with millet as follows:—Wolff gives the composition of Hungarian millet, green, which we will compare with his tables of analysis of Timothy or Herds grass, as below:—

Composition of the Ash.

| | Ash. | Potash. | Soda. | Magnesia. | Lime. | Phos. acid. | Sulph acid. | Silica. | Chlorine. |
|---|---|---|---|---|---|---|---|---|---|
| Millet, | 7 23 | 3 4 | – | 8.0 | 10 8 | 5 4 | 3.6 | 29 1 | 6 4 |
| Herds grass, | 7 01 | 3.8 | 2.7 | 3.7 | 9.4 | 10 8 | 3 9 | 35 6 | 5.0 |

Or, calculating the results of the analyses in another form, we have:—

Composition of the Fresh Product.

| | Water | Ash. | Potash. | Soda. | Magnesia. | Lime. | Phos. acid. | Sulph. acid. | Silica. | Chlorine. |
|---|---|---|---|---|---|---|---|---|---|---|
| Millet, | 68 0 | 2 31 | .86 | – | .19 | 25 | .13 | .08 | .67 | .15 |
| Herds grass, | 70 0 | 2 10 | .61 | 06 | .08 | .20 | .23 | 08 | 75 | .11 |

From these figures we deduce that a ton of the two grasses removes the mineral constituents of value as below:

| | Potash. | Phos. acid. |
|---|---|---|
| 1 ton Hungarian grass, | 17.2 lbs. | 2.60 lbs. |
| 1 ton Timothy Grass, | 12.2 lbs. | 4.60 lbs. |

As the millet contains in the analysis given but 68 per cent. of water, to the Herds grass 70 per cent., we have for a new showing:

5,376 lbs. (2,688 tons) Hungarian grass=1 ton Hungarian hay (14 per cent. water.)

5,732 lbs. (2,866 tons) Timothy grass=1 ton Timothy hay (14 per cent. water.)

Or:

| | Potash. | Phos acid. |
|---|---|---|
| 1 ton Millet, dried, removes | 46.24 lbs. | 6.98 lbs. |
| 1 ton Timothy hay removes | 34.90 lbs. | 13,18 lbs. |

If we estimate the value of potash at 7 cts., and phos. acid at 14 cts. a lb., we have the cost of replacement of these ash elements: For 1 ton Hungarian hay $4.21. For 1 ton Timothy hay, $4.29.

We have thus far considered the ash elements alone; but it must be remembered that Hungarian hay removes about 47 lbs. of nitrogen per ton, while the Timothy hay removes per ton about 31 lbs. only; calling nitrogen 28 cts. a lb., we have for the values $13.16 for the ton of millet and $8.60 for the ton of hay.

If these analyses represent the correct composition of our crop, we have as a measure of their exhaustive property, the following sums:

| | Nitrogen. lbs. | Potash. lbs. | Phos. acid. lbs. | Value. |
|---|---|---|---|---|
| Millet, dried, per ton, | 47 | 46.23 | 6.98 | =$17 37 |
| Timothy hay, per ton, | 31 | 34.90 | 13.18 | = 12.97 |

It would seem from these results that Hungarian is an exhaustive crop; but yet one thing must be considered: It is not very exhaustive of the ash elements, which are fixed in the soil; and of the nitrogenous elements, it is quite sure that, if not removed from the field by the crop, they would escape into the sub soil. Hungarian grass then may be esteemed in some cases as a *conservative* crop—a crop applied to preserve elements which otherwise would go to loss. We are justified by these facts which we have presented, in warning against millet as a regular crop, to be grown by purchased manures. There is nothing, however, shown here to countervail against any experience which would tend to show that this crop may not be readily raised from manures deficient in that expensive element, nitrogen, as we do not know as yet the power of the plant to assimilate soil nitrogen which is usually to a large extent unavailable as plant food. We are in need of further data regarding the growth history of millet.

As to the feeding value of millet, cut when in blossom, we are at a loss what to say. Some parties regard it as equal to hay, others as inferior. Of one thing only are we certain, cattle like it, and do well under it, but this leaves the question of comparative economy untouched. The analysis of green millet (*panicum germanicum*) in blossom is as below:—

| | Water. | Organic matter. | Ash. | Albuminoids. | Carbo Hydrate. | Crude fibre. | Fat. |
|---|---|---|---|---|---|---|---|
| Millet in blossom, | 65 0 | 32 0 | 2.4 | 5.9 | 15 0 | 11 5 | 1 5 |
| Grass, before " | 75 0 | 22 9 | 2 1 | 3.0 | 12.9 | 7.0 | 0.8 |
| Grass, after " | 69.0 | 29.0 | 2.0 | 2.5 | 15.0 | 11.5 | 0.7 |

As the feeding values of articles are usually calculated on the percentage of albuminoids, these analyses would indicate a higher feeding value than we usually see ascribed to millet. It is hard to believe but that it must be at least equal, and probably better than grass; but if to such an extent as is here shown, whence the discrepancy of opinion in the practical estimates?

It is well for the farmer who has this crop, to harvest while in bloom, so as to obtain the fodder at the period of the greatest nutriment in the whole plant; and when successfully stored, then it would be well to compare its feeding value, in the ordinary rough way of the farm, and come to an understanding with one's self whether it be a profitable crop to cultivate. Despite all we have written we believe it is, under our system of farming; and forming opinion from our own observation, we cannot believe that the amount of nitrogen indicated as necessary by the analyses, is needed to be applied.

One word of caution: There is a suspicion (more than suspicion—certainty—Ed. C. F.) that over-ripe Hungarian—that is cut for fodder, after the seed is formed—is injurious when fed to animals. We have heard instances of injury which have been ascribed to feeding millet in seed, and it is best, therefore, as a rule, to keep on the safe side, by cutting in the bloom; a course otherwise to be recommended.

## Lime on the Fallow.

The fallow should be dunged or limed between the fourth and last ploughing, but it is questionable policy to apply both of these fertilizers simultaneously. Lime sets free ammonia in the very essence of dung, so that a want of compatibility is apparent in dressing both on the land at the same time. If it is determined to apply lime, the more caustic its condition when incorporated with the soil the better. For this reason many farmers of clay land plough in the shells at once fresh from the kiln, a course which we scarcely feel justified in recommending, on account of the partial distribution of the lime so applied through the soil. Small heaps drawn out from the carts, and protected from heavy rain by a shovelful of earth thrown over the top, is a very good plan; and these are easily spread, when the shells are reduced to powdery condition.

On no soils are the benefits of lime more apparent than upon those under consideration; and if mixed with the soil before it becomes effete from exposure, it will be found to greatly assist in decomposing the vegetable matter in the soil, neutralizing acid substances (which are invariably formed during the imperfect decomposition of such matter), and also to cause the land to work more easily. The amount which ought to be applied per acre must depend upon the peculiarities of each field, but clay lands which have not received a dressing for many years will be all the better of 300 bushels per acre, a quantity which, we are assured on scientific authority, adds just about one per cent. of lime to the staple of a soil ten inches deep.

It has been contended that lime impoverishes the land, but such is true, in a certain sense, of every application, excepting those which like dung contain all the constituents required by plants. If lime increases a crop that removes potash, phosphoric acid and nitrogen from a field, it is evident that these constituents, not existing in quantity in the lime, must be appropriated from the soil. In this sense, lime, nitrate of soda, and even superphosphate of lime must be regarded as exhausting. But, as is well known, a good farmer is constantly adding to the general stock of plant food in the soil, by various measures, such as the feeding of cake, and the importation of various fertilizers. So that, on well managed farms, the cry of exhaustion is utterly vain and unfounded.—*Agricultural Gazette.*

TEST WITH FERTILIZERS.—It is well known that different plants require, to some extent, different fertilizers; and recently it has been found by Lehmann that the same plant demands a change of plant food in the course of its growth. Thus Indian corn did best with ammonia salts the first forty-one days; after that nitrates had the greater effect. So with tobacco. Buckwheat fed best upon nitrates throughout. Lupine it was found gets its nitrogen from the atmosphere. In some experiments made last summer I got a great growth of clover from a dressing of the contents of the earth closet, the growth being made the latter half of the season, while the grass mixed with the clover showed much less effect throughout. The thing was reversed where sour milk was used, which grew the grasses almost unprecedentedly, leaving the clover far behind. So we know plaster to be favorable to the *leguminosæ*, but having generally little effect upon the *gramineæ*. Milk, which combines many properties, like barnyard manure, is a general fertilizer. Applied upon an old sod, never ploughed, growing the various grasses and numerous weeds, it pushed them all, though with a difference. Applied upon clover alone, it did well, but was most remarkable upon the grasses, whether grown alone or otherwise. I also found it a powerful stimulant upon strawberries which I transplanted in the fall somewhat late, the plants showing through the winter a rich healthy green. This, with the other experiments, was made upon the poorest soil—drift, composed almost wholly of sand, gravel and clay. The sod had in addition some accumulation of vegetable material.—*Country Gentleman.*

THE GREAT VALUE OF HUMUS.—Humus consists of fine muck or vegetable mold. Few farmers whose soils are deficient in humus know the great value of this element of fertility. The humus of compost and the organic part of the manure, with which the gardeners literally fill their soil, has ten or twenty times the absorptive power for water of the sandy portions of soil it is mixed with. The porous nature of the subsoil drains away all excess of moisture, so that what is left does not obstruct the ingress of heat. But when heat penetrates two or three inches into the ground there is, in the organic matter, sufficient moisture to absorb and retain the heat; so that by reason of the presence of sufficient humus and organic matter, moisture is retained, and the moisture, by reason of the great power of water to contain heat, insures the retention of heat in such proportion chemically to moisture and in such large proportion to the substance of soil as to insure the chemical disintegration of the manure, and therein the feeding of the growing crops with equally surprising and profitable rapidity. * * * * Now, if humus and other organic matters thus insure the retention and combination of the proper proportions of heat and moisture, to promote, in part, their own reduction to the atomic state in which plants absorb them as food, organic matter being present and within the reach of heat in large quantity, is it not equally apparent that the largest proportion of the organic matter of soils should be left to compose the surface mold? I mark the word mold, because in many instances after ground is planted, there is little if any mold, properly so called, left at the surface, especially on lands with a sandy or gravelly subsoil and thin surface mold. In clay, which is itself a great absorbent of heat and moisture, vegetable matter is necessary to keep it loose and to admit heat. In sandy loams, into which heat penetrates without water, vegetable matter is necessary to insure the retention of both heat and water for a sufficient length of time to promote the solution of plant food.

# Horticulture.

## Growing Roots, Kohl Rabi and Cabbage for the Farm. No. 3.

The operation of transplanting is thus conducted:—The plants in the frame are first well watered. As soon as the water has gone off enough to prevent stickiness, the ground is loosened with a circular trowel and the plants withdrawn in such a way that the roots and fibres are injured as little as possible. When taken out in bunches they separate with much less injury than when withdrawn singly.

The ground being holed with the dibbler one man precedes the other and drops a plant at each hole (or two if two are used), the other following after with a semicircular garden trowel, places the plants in position (always at the same part of the hole), buries the root carefully, so as not to allow the top root to curl up, sets his foot on the ground to make all firm and passes on to the next. One man or boy can drop for several planters. After this the entire cultivation is done with the horse hoe, the plants are never again touched with the hand until harvested.

Now, the idea of transplanting, to a person not used to it, has a terrible sound, but in practice it is nothing. The writer as an old turnip hoer and transplanter states fearlessly, that he would rather plant in this manner an acre of land, than hoe half an acre of broad cast turnips or single a quarter of an acre of beets or mangles, and anyone who has passed so many weeks at a time on his hands and knees in this interesting operation (of singling beets), as the writer has in his younger days, will fully realize the fact that singling beets and mangles is the "meanest" work done on the farm. In transplanting beets from the frame, all this singling is done in separating and putting down the plants to the holes, and, what is more to the purpose, is done when a man is right end uppermost. Besides this it gives the opportunity of selecting and trueing the plants set out, where that is an object, at all events it gives the best possible opportunity of selecting the finest plants.

It will thus be seen that the entire operation of raising a crop of turnips is conducted with *one* handling only and no hand hoeing—all the work is done by horse-power, and with the least possible amount of manual labor.

Transplanted swedish and other turnips, like cabbage, broccoli and cauliflower plants, are apt to be affected by the "white worm"; which is believed to be the maggot of the turnip fly, or at all events of some other fly, and as this is never seen in the operation of laying its eggs, it is supposed to be a night insect. If you want to prove this fact of the eggs, take a cauliflower or broccoli plant, wrap the stem loosely round for about one third of its length from the leaves and plant it. it will grow the same as any other, but if you take it up and examine it in the course of a few days, you will find part of the stem enclosed by the paper covered with fly spits, and in a day or two more, these fly spits turn into the white maggots and attack the stem. This plan of wrapping the stems in paper is often adopted to guard against the black grub, and it is quite effectual for that purpose, but it certainly rather encourages the white worm, or at all events renders it more apparent.

The only cure for the white worm hitherto known (and that is not always efficacious) is watering the plant as soon as planted with corrosive sublimate water, made as before described. The writer has never known this to fail, but others have The difference may be in the manipulation.

It is believed that Paris green applied to the roots before planting would be effectual, but that has to be proved. If used at all it must be used in such small quantities and in such a careful manner as not to render the roots of the turnips poisonous. As for broccoli and cauliflower, as the stumps and roots are not eaten, it could not be injurious to them, and it has been proved by the most careful chemical analysis, that plants do not absorb Paris green No kind of cabbage or similar plants are ever affected with the white worm while in the seed bed.

The next and principal thing in this system is the Dibbler. This is composed of a roller drawn by a horse, on the surface of which roller are two rows of excrescences or teeth of such a shape that when they roll over the ground they leave a series of holes as deep as themselves and exactly the same distance apart. The two rows of teeth are two feet apart from one another on the roller and the teeth are exactly two feet apart from each other the other way; two of these teeth are brass, the rest cast metal (iron). The reason they are brass is because it is *absolutely necessary* that when the machine is started at the end of the rows, these teeth should be exactly upwards, and pointing to two excrescences on the frame of the roller, to show that they are exactly placed before commencement

This roller is attached to the frame by two strong guides which keep it in position and drag it. The axles of the roller move up and down in a slit in the guides, and the guides have attached to them a wheel at each end by which the roller part of the machine may be moved and the roller kept off the ground when required The roller is raised in these guides or grooves by two small pinions worked by a lever or rack and pinion, and is so arranged that, when the roller is in operation, the wheels and frame are raised, and thus the entire weight of the wheels, frame and part of the shafts rest on the roller and crush it on to the earth. The roller when dragged forward of course revolves, the teeth are pressed into the ground, and being conical at the sides and sloped away at the end where they rise out of the earth, they make the holes perfectly clear. The front of the teeth are angular, so that the plants being placed in this angle may be always in exactly a correct position, and in row with one another.

In starting the machine at the end of the field on which it is intended to operate, the machine is brought to the place on its wheels, with the roller suspended, and clear of the ground. A straight line is marked off or laid off

with a long line or by a straight furrow laid off with sticks in the usual way. This line must be laid out truly, as it is to form the base of all our future operations. The machine is brought to this line on its wheels, the roller is then turned round on its axles until the two brass teeth are exactly upwards and pointing to the index excrescences placed above them; the machine remains still, and the roller is then lowered on to the ground and the frame and wheels are raised clear off it, the teeth on the under side of the roller are thus crushed into the ground and form the first holes always exactly on the base line, the horse is then moved forward, the roller with its teeth revolves, the teeth press into the ground and form the holes into which the plants are to be inserted and the roots buried by the transplanters with their trowels. The machine is conducted by leading the horse with a stick, and taking care that he goes as straight as possible, and that the marker of the roller always follows in the mark left in the ground in forming the previous rows.

To insure this, there is a marker at each end of the frame, or on the shafts which drags on the ground and makes the required marks. On advancing, the machine is kept with its marker in the last of the mark tracks, which should be in the middle of the space between the rows, while the marker at the other end makes a new mark for the next row. As soon as the machine arrives at the end of the field opposite to which it started, the roller is lifted, the wheels run on the ground, and the machine is removed on its wheels to the starting end, there the roller is placed in position with the brass teeth upwards as before, and is started in the same manner to make two new rows of holes.

On the top of the machine is a strong tray in which stones or other weights may be placed until sufficient weight on the roller is added to secure its certain and perfect operation. Where the nature of the ground requires it, pointed teeth may be added between the dibbling teeth to insure the correct turning of the roller and prevent the possibility of its dragging on the surface. It will thus be seen, that this roller with its teeth (always being placed in proper position at the commencement), forms a parallel ruler, which passes over the field in the same way as the paralled ruler of the architect passes over the surface of the paper in making a new plan, and the teeth always form the line of holes exactly true each way, thus insuring the possibility of operating with the horse-hoe, first one way and then across.

If the precaution of placing the teeth always in one position at starting was not adopted, the holes could not be made opposite each other in the cross way of the rows, because let the machine be as perfect as you may (without this precaution), the slightest errors would be magnified by the distance to which the machine travels, just in the same way as it is found almost impossible with a pair of compasses, when marking out paper, to make the holes or pricks in the paper come exactly alike.

Of course when required the roller may be made of greater length and with more than two rows of teeth for the holes placed upon it, and it may be drawn by two horses. The roller should be at least forty inches in diameter. This would afford nine teeth in each row. The wheels must be high enough to admit of the roller being raised entirely clear off the ground, the roller may be either built of solid wood or constructed like a strong cask or made of cast iron.

SUBSCRIBER.

## Kohl Rabi.

The name Kohl Rabi, to a person hearing it for the first time, is more suggestive of something to do with the people of Israel than of a plant which is deservedly becoming more popular on both continents. It is a brassicaceous plant which forms a kind of bulb or swollen stem intermediate between a cabbage stump and a turnip, and marked all over with picturesque gashes or scars, as if it had been in the wars. To grow a good crop of kohl rabi requires a heavy soil that was well prepared in autumn; indeed, the soil cannot be too good for it. The seed is sown early in the Spring, and it is customary to plant out from the seed bed in showery weather. When sown where they are to stand, the rows should be 2 to 2½ feet wide, and the plants are ultimately thinned to 15 inches. It is very hardy, very nutritive, seldom fails, and, all points considered, is a better paying food crop than turnips. As a garden crop, kohl rabi is not without its value. Grown quickly, and taken up small and boiled without being pared, then pared and buttered, it is a delicious vegetable. The purple variety is a mere curiosity; if a profitable crop be wanted, the green variety only should be grown. It must be eaten as freshly-gathered as possible. Several market gardeners around Toronto now grow the plant as a vegetable. It is largely grown in England as a farm crop, and is found very profitable. The cut is from the catalogue of Wm. Rennie, of Toronto.

## Remedy for Girdled Fruit Trees.

I noticed in a recent number of the *Recorder*, that one of your subscribers gives his manner of keeping up flow of sap, in trees girdled by rabbits, by grafting over the wound, etc. I think I have made a discovery which may prove quite a valuable improvement on the above plan. Valuable, because simple, and the remedy always at hand, and will require no expert to perform the surgical-like operation recommended by above. In the spring of '74, before sap started, rabbits gnawed the bark off of one of my dwarf Bartlett pears, standing in my yard. The tree was so completely denuded of bark all around, that I thought it "hopelessly done for." I spaded a mound of fresh earth around it several inches above the wound, and left it in that condition to die - not knowing any remedy that would preserve it. But it came out fresh in spring with the other trees, and kept perfectly green all summer. I did not remove the dirt until the next fall, when to my astonishment, there was a complete connection of bark—the wound was healed, and it is now as healthy as any tree I have. In spring of '75, the rabbits girdled a young apple tree in the same way, only more so,—taking the bark off for six inches or more all around. I threw a mound of earth around it and left it as I did the pear, until last fall, when, on removing the dirt, it had also healed over and made new bark. Now, sir, I would like for some scientist to explain. The bark, while forming, I noticed, rose up in

bumps, like rough excrescences, about in places on the hard wood, and finally united and became confluent or solid perfect bark. I am going to experiment further, and test it more fully, though there is no doubt about these instances, and particularly the last, where they healed and formed the new bark. I would like for some one else to try it also, and give the result of the experiment—but should it stand the test of experiment, and proves what I am sure it has proven with me, I hope no one will get a patent on it—if they do, I shall use my own dirt in that way, without paying anybody for the right to do so, when ever occasion may require. —*Cor. Fruit Recorder.*

## Some of the Best Raspberries.

At the last meeting of the New Jersey Horticultural Society, William Parry, of Cinnaminson, N. J., submitted a paper concerning raspberries, from which the following is copied :—

The Brandywine raspberry is a large, bright scarlet berry, firm and beautiful; bears carriage well, and commands a ready sale in market. The fruit brought from fifty to sixty cents a quart, wholesale, the past summer. The foliage and general appearance resemble the Pearl, from which it is probably a seedling, though the leaves are of a lighter green colour. If the bushes are put out a week earlier in spring, they will make a much better growth. They are broad and crimped, and when they first appear at the top of the canes are shaded red, which disappears as the leaves attain more size and age. The young stems are generally green while growing, though occasionally a shade of reddish brown next the sun, without the white bloom so abundant on other kinds. The origin is unknown, though it found a congenial soil in Brandywine Hundred and along the Brandywine Creek, near Wilmington, Del., where it succeeded so well as to attract much attention by the price and ready sale of the fruit in market. The berry was formerly called Susquecco, which is the Indian name for Brandywine. It is a valuable raspberry for transporting a long distance to market, though its reputation has suffered improperly by reason of Bristol and other inferior raspberry plants being sold for Brandywines.

The Bristol is a native variety found growing near Bristol, in Pennsylvania, from which its name is taken. The plants have narrow, pointed leaves, and a whitish bloom on the stems This is a strong, hardy, vigorous grower, and produces a superabundance of young canes or suckers, which must be ploughed under or disposed of in some way if fruit is the object, as the young suckers come up so thickly, if permitted to grow unchecked, that they will injure the crop of fruit. The berry is medium size, not so large and firm as the Brandywine, though large quantities of Bristols have been sold as Brandywines.

The Delaware is a new seedling recently raised from the Hornet, combining the large size, firm flesh, and luscious qualities of its parent, with canes perfectly hardy without protection. The fruit is large and pointed. In colour and shape it is similar to the Hudson River Antwerp. The cross diameter is the same as the Herstine, ⅞ of an inch; the length is greater, being 27-32 of an inch. It commands the highest price in the market.

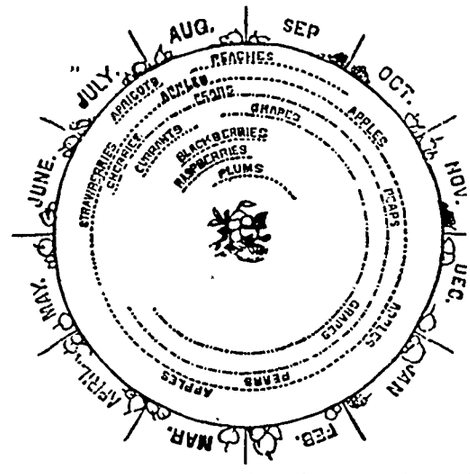
The Pearl is a bright red, medium size, handsome, firm berry; bush dwarfish; a slow grower, with thick, tough foliage. Needs good strong land and high cultivation in order to produce even medium crops of fruit.

## Shaping the Tops of Trees.

Mr. Smith, the veteran nurseryman who has kept up with the progress of the times in matters pertaining to fruit tree management, but repeats an old and yet an ever new and interesting fact, when he speaks of the almost intelligent nature of fruit trees, and the readiness with which they conform to the training and wishes of the skilful and intelligent cultivator. It is interesting to see a man who knows all about the matter, go up to a tree, take hold of its branches, tell what ought to be done with it, what limbs taken out, what branches spread apart, just how to shape the cut, just how to saw a limb – that the sun may enter the whole top and the tree become a truer and better tree. These things are a part of necessary care and management, are as important as manuring or grafting, and have as much to do with the yield of fruit as fighting caterpillars or digging for borers. It is true they are apt to be neglected, or their importance overlooked—but the judicious cultivator attends to these things and makes them tributary to his success and his profits. Trees may be changed, moulded at will, and become just such things as the master would have them. How necessary then, that the master should be intelligent, and know just what he wants his trees to be.—*Maine Farmer.*

## Fresh Fruit all the Year.

We find, says the *Country Gentleman*, that few cultivators, even among those who give considerable attention to raising good fruit, succeed in securing a good supply through the whole twelve months. Yet the task is not at all difficult. It requires indeed some knowledge and care. The sorts which give this supply, at the North, and the times of the year when they are at hand, are distinctly shown in the accompanying diagram. The most abundant supply is of coure during the last half of summer and through autumn. The small fruits in the shape of strawberries, begin in June. The earliest cherries are but a few days behind them. A few weeks later, or about the middle of July as far north as New York, we have early apples, followed closely by the earliest pears and apricots, and the earliest plums. Peaches of such sorts as Hale's Early are on hand by the middle of August, and we shall expect the Amsden and Alexander to ripen here about the first of August. After that, the great throng of summer and autumn apples, pears, grapes, &c., furnish an abundance till winter; and certain varieties of these three kinds are had without difficulty till midwinter. The latest pears, easily raised and easily ripened, are Alengon and Josephine de Malines, which, with common care, keep into February; and with special arrangements, till early spring. The few who know how to raise and ripen the Easter Beurre, may have good pears in April. But as a general rule, and for ordinary management, we must depend mainly on winter apples after February. In a cellar properly constructed to secure coolness, and with care in




assorting and placing aside such specimens as well as such sorts as show long keeping, there is no difficulty in having plenty till the middle of June, when strawberries are ripe. We speak from experience, and have tried it successfully for years.

All this is worth much more than cost, and a daily supply of fresh fruit for the table and for cooking is not only a matter of economy, but promotes health, and is a cheap luxury.

## Growing and Marketing Horseradish.

The horseradish, writes a Maine Farmer correspondent, is very easily and profitably raised, and there is no doubt but it is a wholesome article of diet.

Although horseradish, in its natural state, is generally found in low places, it is found best to grow it in deep rich loam. When planted in low land there are many laterals, but when planted in deep soil it sends its roots down in search of water, and as the root is the only part valuable, the object of the cultivator should be to produce as perfect roots as possible.

The land should be liberally manured with say forty-five loads of stable manure, well ploughed in. Or if more convenient, bone dust may be profitably employed. The land should be *deeply* ploughed, using the *lifting sub-soil plough*, and thoroughly harrowed and marked off into *rows* thirty inches apart.

The sets should be planted so soon as the ground is sufficiently dry.. Take a small crow-bar and along the rows that have been previously marked out thirty inches apart, make holes, say ten inches deep and fifteen inches apart. This will allow four or five inches over the sets. This will allow the free use of the harrow when the leaves are first seen. This harrowing destroys the first crop of weeds, so that generally one hoeing is all the after-cultivation required. Use the harrow fearlessly; it cannot do harm.

It should be gathered the fall after planting. This perhaps is the most difficult work to be performed. To facilitate it a deep furrow may be ploughed among each row but the main dependence must be in the spade. The roots should be taken out as completely as possible, for if roots are left, they will sprout out the following year and cause trouble, unless to those crops requiring repeated hoeings.

As the principal demand for it is in the winter, it may be necessary to store it. They may be secured in pits or placed in a cool cellar, and well covered with sand.

As it may be required for market, the quantity required should be taken from the pile in the cellar (be sure to cover what is left with sand) and the crowns nicely trimmed, and all lateral roots removed, except the larger ones, which may be shortened, but left attached to the main root; the roots should now be cleanly washed, and allowed to drain and dry, if packed in boxes, or they may be placed in barrels with holes bored in them to allow the water to drain away.

The laterals cut away in "trimming" for market may be kept for sets the following year. They should be stowed in a cool cellar with an abundance of sand mixed through them and covering them completely.

Horseradish may also be profitably grown in common with other crops, say early cabbage or radishes. In this case the rows should be marked out fifteen inches apart, and every other run planted with cabbage. The sets should be placed pretty deep, say six inches below the surface This allows the cabbage to get a good start, but should the horseradish come up too soon, the leaves may be cut off with the hoe without in the least injuring the roots.

If the above directions are followed, horseradish can be grown easily and profitably.

MAPLE SEED.—Occasionally, says an exchange, an inquiry comes to us about gathering tree seed, and the appearance of the maples remind us that the seeds of the silver maple and the red maple ripen in two or three weeks after the leaves are fully developed. They should be gathered without delay, and sown soon after being collected. With care in sowing and proper attention thereafter, these varieties may be easily grown. Plant in drills, to the depth of about an inch, the rows being wide enough apart to permit of cultivation with a harrow or plough. If the ground is dry, roll it after planting. The young plants will make their appearance in from a wee' to ten days, and if the weather is very hot, they must be protected with a light covering of straw or by shading the rows with bushes or branches of trees.

RABBIT-GNAWING.—A correspondent writes to the *Fruit Recorder*. In the spring of 1874, before sap started, rabbits gnawed the bark off one of my dwarf Bartlett pears, standing in my yard. The tree was so completely denuded of bark all around, that I thought it "hopelessly done for." I spaded a mound of fresh earth around it several inches above the wound, and left it in that condition to die—not knowing any remedy that would preserve it. But it came out fresh in spring with the other trees, and kept perfectly green all summer. I did not remove the dirt until the next fall, when to my astonishment there was a complete connection of bark the wound was healed, and it is now as healthy as any tree I have. In spring of 1875, the rabbits girdled a young apple tree in the same way, only more so, taking the bark off for six inches or more all around. I threw a mound of earth around it and left it as I did the pear, until last fall, when, on removing the dirt, it had also healed over and made new bark. Now sir, I would like some scientist to explain. The bark, while forming, I noticed, rose up in bumps like rough excrescences, about in places on the hard wood, and finally united and became confluent or solid perfect bark. I am going to experiment further, and test it more fully; though there is no doubt about these instances, and particularly the last, where they healed and formed the new bark.

THE FLAGS.—Lovers of hardy flowers—that class "requiring no attention" cannot select a genus combining greater variety of tint and marking than the Iris. We couldn't undertake here to give a lengthy description of "the finest kinds," even if we knew where to begin, and, what would be more difficult, where to leave off. They are all handsome, with very few exceptions all hardy, remove and divide easily, bloom profusely, and are not at all tastidious about character of soil or situation. In forming, however, even a small collection, one should not think of omitting our two native species usually found in most of the Middle States, the I. Virginica and I. Versicolor. Although natives of low, damp situations, they thrive just as well in dry soil, and produce an abundance of their delicate blue flowers in June. Who does not remember with pleasure the old-fashioned blue flag of gardens, now unfortunately but seldom seen? Its great flaunting deep indigo blue flowers are among the first to present themselves to memory as we recall many a straight bed bordering the walk from gate to doorstep. This neglected species has served another excellent purpose, it being the parent of the large portion of the many splendid varieties that grace the flower beds of European cottages, and we wish we could add of American likewise. Cultural hints for this family are few, as they are so perfectly able to care for themselves. They look well massed in a bed, or scattered through a group of shrubbery, or even with other perennial plants. Although succeeding best in the full light of day, they thrive in moderate shade, and possibly retain their flower a little longer when protected from direct rays of the sun.—*New York Tribune.*

# Live Stock.

## A New Sheep Wash.

The English papers have accounts of the public trial of a new sheep wash and new dipping apparatus discovered and invented by a Mr. Little, a gentleman not unknown in scientific agriculture. One thousand lambs were dipped during the day in the presence of a large number of flock masters, graziers, and farmers, to show the rapidity and convenience with which sheep may be cleansed with cheap and simple means. The character of the chemical fluid employed is in many respects very remarkable; for although it is so powerful in effect with respect to the destruction of insect life, it is perfectly harmless in its action on the sheep. In appearance it is a thin transparent black fluid, but directly it comes into contact with water, in the proportion of one part to a hundred, it is as by magic turned into milk. Nothing can possibly be more simple than the process of mixing, as it requires no warming or special manipulation to make it ready for use. It has no ill effect on the hands or arms of the men using it, and the entire absence of all danger is proved without the least doubt, from the fact of Mr. Little having administered *internally* to a number of small lambs as much as a *quarter* of a pint of purified fluid, of the same strength as used for dipping, without producing the least ill effect in the lambs whatever. Highly interesting and important experiments are now being carried on for the purpose of destroying internal parasites, especially that terrible scourge known as "the worm in the throat," which he hopes to destroy, and, what is still better, to show that in this matter "prevention is better than cure." To wish success to this valuable agent is to wish well to all persons interested in wool and mutton. Other simple and ingenious forms of apparatus for washing or pouring older sheep were exhibited by casting or fixing a number together on their backs. As a question of economy and portability in carriage for foreign countries it is important, because one gallon will bear diluting with a hundred gallons of water for ordinary dipping, making double the quantity of most other materials, and at the same cost. Its action on wool has been tested at Bradford by washing; it leaves the wool soft and silky in character, and without any evidence of discolouration or stain.

## A Sheep-Shearing Machine.

Of great interest to all who grow sheep on a large scale are any inventions which tend to reduce the expense of harvesting the wool-crop. About a year and a half ago, we published a cut of some improved sheep shears which seemed, judging from the multitude of enquiries which poured in upon us, to be just the thing. Since then, however, we learn that those shears have been still further improved by making them cut with the back action as well as the forward. We have no doubt that when the implement is perfect, its sale will be pushed on this continent.

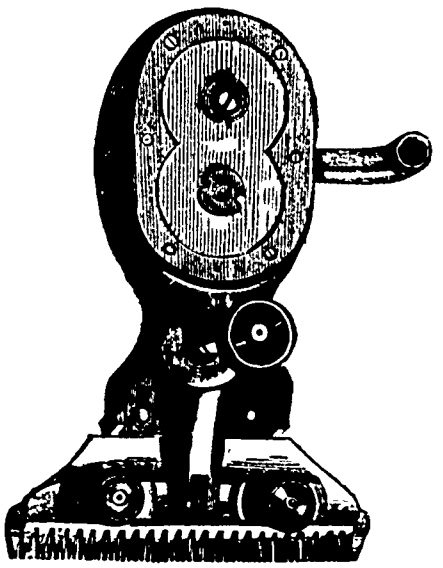
As of interest in this connection we reproduce from the *American Agriculturist* an engraving of a wool-cutter which is driven by compressed air. Of course it will be of more use among the great flocks of Colorado and New Mexico, than among the less numerous flocks of Canada. It is claimed for the machine that a sheep can be sheared in five minutes much better than could be done by hand. The fleece is cut off very evenly and closely with this machine; the sheep cannot possibly be cut by it; and there can be no cutting through and injuring the staple The cutters, made precisely upon the principle of the mowing-machine knives, are of chilled steel, and are self-sharpening. The motion is communicated by means of compressed air which reaches it through a pipe attached to the tube on the left side of the machine, and 3,000 revolutions per minute can be easily given to it, although 1,500 revolutions are sufficient for a working speed. The air pump is worked by a crank, and one man can produce sufficient power to work 25 machines. The air is forced from the pump through a flexible rubber tube, which allows ample freedom of movement. The working pressure of the pump is 5 lbs per square inch, but it may be worked up to 45 lbs. by using an engine or windmill. One pump is sufficient to work 25 of the shearing machines, and these may all be attached to a supply pipe, from which the compressed air may be let off or on to the machine as needed, by taps. Thus one pump will supply power for 25 shearers, and these having merely to hold and direct the machine, which barely fills the hand, and requires no muscular force to work it, are not exhausted, or required to stoop over the sheep—if benches are used—and may therefore work more quickly and certainly than with the ordinary hand-shears.

The machine is also adapted for clipping horses, for which purpose the motive power used, and the method of attachment, are well adapted. It is also perfectly adapted for shearing pelts, instead of "pulling" the wool from them, by which the quality of the fleece is injured.

## Shearing Years.

Concerning the causes which go to produce what is called a "shearing year," R. M. Bell, who is a noted Illinois sheep-man, writes from the Sacramento valley to the *National Live Stock Journal* as follows:—

Shearing years are not to be accounted for on the old trapper's theory of "mild winters make light fur." On this theory, Vermont would shear heavier fleeces than Texas or California, the winter being severe in the one, and being none in the other two regions. This pet theory of trappers and guessers has no foundation in the facts as we find them. In the Sacramento valley we handled a flock of Vermont ewes that clipped, at the two shearings they give sheep there, 17 pounds of wool, unwashed. The condition as we noticed, promised to be as free from dirt



SHEEP-SHEARING MACHINE.

and trash as Illinois wool. These ewes in Vermont probably would average 12 pounds, not more. The climate in Sacramento valley is very mild—ice as thick as a trade dollar is a severe freeze. Quite the same condition and results are found in Texas.

Now, we all know we have shearing years. The winters preceding these extreme clips differ. The summers have as much to do in making this difference as the winters. The rains of 1875, that came in May and June, produced grass so abundant and washy, as to seriously interfere with the health and condition of sheep in Illinois and Missouri. The wool failed to grow during this time, and the vigor of the sheep was so impaired as to prevent the growth for a time after we began to feed. Those who began to feed early, or, better yet, who continued to counteract with corn the effects of the poor grass all summer and fall, found no such serious falling off in weights of fleece. Three years ago with us was a light shearing year. A drouth set in in June, and for three months we had no grass, and the sheep did poorly for three months, and the fleece for four or five months. If the sheep are well summered, the wintering is easily done, if feed is abundant, and the finest success produced in heavy, good fleeces. Flocks unhoused shear lighter, of course, when the spring rains are abundant and warm—the yolk is the more readily dissolved and washed out. I notice a fine report from certain flockmasters every year, confirming the opinions I have given above. If the conditions of health and thrift are such as to secure a growth of wool every day of the 365, we have a shearing year. A mild winter to a well fed sheep is agreeable, and favors carcass, and so fleece. Good shelter counteracts, or helps to resist, inclement weather. Grain, though stoutly opposed by the average stockman—except short-horn and hog men—should be fed any time in the year when the quantity or quality of grass in the pastures make it necessary, to enable stock to preserve condition and growth. Breeders with small flocks of fancy sheep often force a growth of fleece; and in so producing an enormous weight, weaken the physical force of the sheep, so that there will be a falling off next year, and the previous enormous growth may never be repeated by the same sheep. Good, creditable shearing is that which reports the same sheep, year after year, by number in car, and is careful to give exact date of growth of each fleece; then you know there is no stubble shearing, nor reporting every other year.

## The Neat Habits of Swine.

It is a prevalent belief with the majority of people, says the New York *Herald*, that swine are filthy animals. But no impression is more erroneous. The truth is, there is no other domestic animal that is naturally so neat and clean in its habits as swine. The reason why swine have had the odious reputation fixed upon the race as being "as filthy as swine" consists in the fact that these animals are usually confined in small pens or filthy yards, where it is impossible for any animal to keep clean. Let swine have the advantage of a spacious yard and every animal will deposit its fæcal matter near some corner. A sow having a large brood of pigs will soon teach every one to keep their feeding and sleeping apartments free from all droppings by going to some distant corner to cast out all fæcal matter. Horses, mules, neat cattle and sheep will not do this. They will all drop their orduro and urine where they feed and where they are accustomed to lie down, until the floor is literally covered with filth. Professor Law, when alluding to the filthy manner in which swine are kept, says it is here that the pork raisers are most frequently at fault. Fifty or a hundred pigs are allowed to crowd together in a filthy manure heap, a rotten straw stack, or under a barn subjected to the dropping of other animals, as well as their own products. Their feeding troughs and drinking water are so supplied that they can get into them with their filthy feet, and they must devour the most obnoxious matter or starve. If, under this abuse, disease is developed, the healthy are left with the sick, as "they will all have it, any way," and the result is usually a clean sweep. Hence, to avoid all diseases, and especially hog cholera, swine must be kept clean. Protect them from the hot, reeking bed of manure and close sleeping place, where the emanations from decomposing dung, urine, straw and other organic matter are added to those of their own skins and lungs when huddled together in great numbers. See that both food and water are clean, in the sense of being free from disease germs and from the microscopic particles of decomposing organic matter, which, within the system as well as outside of it, furnish appropriate food for the disease, poison and favor its increase, while they depress the vital powers and lessen the chances of the virus being thrown off. No less important is the purity of the air, since the delicate membrane of the lungs, perhaps more than any other, furnishes an easy mode of entrance for any injurious external matter. Finally, purity of the blood can only be maintained by a healthy functional activity of all the vital organs, which insures the perfect elaboration of every plastic constituent of the blood and the excretion of all waste matters that have already served their purpose in the system. By perfect cleanliness the poison, even if generated or introduced, will be virtually starved out as surely as an army in a closely besieged fortress. But it will be observed that this implies the separation of sound from diseased animals, and the free use of disinfectants (solutions of sulphate of iron, and chloride of lime, fumes of burning sulphur, &c.) to purify the air and other surrounding objects, as well as the simple clearing away of filth.

## How to Have Healthy Pigs.

Prof. Law, of Cornell University, in a communication to the *Husbandman*, writes as follows in regard to the proper treatment of swine for the prevention of disease: "Keep your hogs clean. Protect them from the hot, reeking bed of manure and close sleeping place, where the emanations from decomposing dung, urine, straw, and other organic matter are added to those of their own skins and lungs when huddled together in great numbers. See that both food and water are clean, in the sense of being free from disease germs and from the microscopic particles of decomposing organic matter which, within the system as well as outside it, furnish appropriate food for the disease poison and favor its increase, while they depress the vital powers and lessen the chances of the virus being thrown off. No less important is the purity of the air, since the delicate membrane of the lungs, perhaps more than any other, furnishes an easy mode of entrance for any injurious external matter. Finally, purity of the blood can only be maintained by a healthy functional activity of all the vital organs, which insures the perfect elaboration of every plastic constituent of the blood, and the excretion of all waste matters that have already served their purpose in the system. By perfect cleanliness the poison, even if generated or introduced, will be virtually starved out, as

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## Shorthorn Measurements.

The *London Farmer* contains a table giving the measurements of Colling's renowned bull Comet and cow Juno, taken from a work printed about the beginning of the present century, side by side with those of cattle from several modern herds. As we have not room to reproduce the table in extenso, we give below the figures as regards two of Lord Skelmersdale's cattle, to show how they compare with the Shorthorns of a long antecedent generation. Perhaps some of our American breeders may take sufficient interest in the subject to furnish measurements from their own herds, which, if not published in detail, would at least serve to show in what direction, if any, there seem to have been changes of size or proportions on this side the Atlantic. The figures we select are given below.

| | Colling's Comet. | Baron Oxford 4th. | Colling's Juno. | 1st Duchess of Oneida |
|---|---|---|---|---|
| Height of | | | | |
| Hind quarters | 59½ | 61½ | 57½ | 54 |
| Shoulders | 59½ | 61 | 55 | 53 |
| Knee | 17 | 16 | 15 | 15 |
| Hock | 20 | 22 | 20 | 21 |
| Ground to Brisket | 18 | 19½ | 22 | 18 |
| Ground to Chest | 25 | 24½ | 24 | 23 |
| Rump to extremity of hip bone | 26½ | 26 | 26 | 25½ |
| Poll to tail | 90 | 93 | 82 | 87 |
| Face | 20 | — | 18 | 19½ |
| Horn | 11½ | 11 | 10½ | 11 |
| Around the | | | | |
| Neck | 43 | 54 | 35½ | 37 |
| Chest. | 88½ | 101 | 82 | 84 |
| Knee | 10 | 14½ | 13 | 12 |
| Fore leg bone | 8½ | 9 | 6½ | 7½ |
| Coronet of fore foot | 13 | 16 | 11 | 14 |
| Hock | 19 | — | 16 | 16 |
| Hind leg, bone | 10 | 9½ | 8½ | 8 |
| Coronet of hind foot | 14 | 15 | 12 | 13½ |
| Horn | 8 | 10 | 5½ | 7 |
| Breadth of face across eyes | 10½ | 11 | 7½ | 9 |
| Breadth of hips. | 27 | 26 | 24 | 25 |

It will be observed that the differences in the above instances are seldom marked in character. Baron Oxford 4th stands a little higher than his great predecessor, though shorter in the leg below the knee; is deeper in the chest, and considerably larger in girth at that point; is longer from head to tail by 8 inches; somewhat finer in bone, if we may judge by measurement of the leg bones, and at the knee; rather longer and thicker in horn, and broader in face, but not quite as broad across the hips. In cows, on the other hand, the 1st Duchess of Oneida is not as high in stature as Colling's Juno, but, like her compeer, longer in body, much the same in girth, somewhat broader across the hips, with merely a fraction's difference in many other measurements.

Of course, as the *Farmer* says, "condition may make considerable differences in some of the measurements, although not in all. Judging of the appearance of Comet and Juno from the engravings in Garrard's book—and the artist author claims great fidelity for the likenesses—Comet is only in fine useful store condition. Juno is more fleshy, but not in anything like modern exhibition form. But we are not sure that the measurements were taken at the time the animals were drawn, although it is highly probable such was the case."

## Small White Pigs.

These offer a marked contrast to the large white sorts last described, not only in the matter of size, but in quality, early maturity, and delicacy of character. It is difficult to imagine that such elegant and complete specimens of porcine development were derived from a common origin with the lop eared, coarse skinned, big-boned animals that were the progenitors of the present large variety. The influence of suitable crosses has, we know, a remarkable effect, and so it may be that Chinese blood laid the foundation of the present small white sorts. These are found distributed in several counties, but more especially in parts of Yorkshire—so much so that they are frequently described as small Yorkshires. At the present time, however, they are quite as famous in Lancashire, Suffolk, and Berkshire. These small sorts may be described as "gentlemen's pigs," rather than as being in favour with tenant farmers. The late Lord Ducie cultivated the sort. Lord Wenlock's breed was for many years famous in Yorkshire. Mr. Samuel Wiley (whose death was recorded last year at a very advanced age), amongst his other successes, stood high with a breed of small whites remarkable for quality; Sir George Wombwell took prizes, *cum multis aliis*, principally Yorkshiremen. Both Her Majesty and Lord Radnor cultivated white varieties of the Berkshire, but they are neither in size, quality, nor character, good types of the small breed of late years. Mr. Sexton has distinguished himself with small white Suffolks, though his fame will rest principally upon his success with the black sort. Mr. Peter Eden of Manchester, and, through him, Lord Ellesmere, of Worsley, have made the small whites famous.

We have said that the small whites are more adapted for gentlemen and amateurs than for ordinary occupiers; and we make this statement for at least two reasons—the small size they reach, comparative delicacy, and small breeding properties. Whilst the large sort frequently produce really large litters, these seldom exceed seven to nine. Much attention is required in the early stage Sudden exposure to extremes of temperature is very injurious. The great merit of the breed is its beauty and extraordinary feeding properties. It is impossible to keep them poor; the tendency to lay on fat is remarkable; hence they are well suited for porking purposes, but lack the lean meat so desirable for bacon.

Of late years the middle breed, derived from a cross between the large and small sorts, has come so much into use that it is sometimes difficult to find a pure small breed, and they are valuable, when they have been kept intact, as improvers of coarser sorts. Thus the pure-bred boar effects a marvellous change in a very short time, and we have found great advantage from this cross upon the Berkshire, whereby we retain the lean meat and increase the fattening properties. It is a curious fact that, generally speaking, the produce of the Berkshire sow and the small breed boar are white occasionally, but not often spotted. In form and character they follow the sow rather than the boar, completely contradicting the theory advanced by Mr. Fowler and others, that form follows the sire and the internal parts take after the dam. We have not gone on with the cross; probably the second generation would be more mongrel. For mere feeding purposes we have found the cross most excellent.

It is rather difficult to write a description of an animal so as to convey an intelligent idea of that which we wish to represent. The head, although in the matter of money value small, is of the highest importance as giving beauty and character. The snout should be dished, and so small that when the animal is fat all we see are the upturned nostrils; these should be small. The forehead, flat and broad (though in a fat state the development of flesh almost hides this organ), makes the contrast all the greater. In the fat animals the position of the eyes is indicated by creases of fat; they are invisible. In the store animals the eye should be large and lively. Great importance attaches to the size and form of the ears—by no other mark can we so accurately determine the purity of the breeding; they must be small, and not drooping, but slightly inclined forwards, wide set apart, and covered with short, soft hair. In order to complete the short, handsome head, the chops must be full and large; it is this which gives the wonderful side view, which is so admirably rendered in the picture. The neck is very full, and the head well set on, at a somewhat lower level than the line of the back. The shoulders are wide and well covered, sloping back into the carcass, and thus avoiding the hollow and deficient fore flank so often seen, and so unsightly. The ribs are full, and the loin sufficiently wide to preserve the uniform *contour;* the tail set on high, though hardly so much in a line with the back as in the black Suffolk, to which breed, it will be seen, the outline bears close resemblance. The hams are deep and square—"meat down to the hocks" is a very correct description of this important part; bone fine and offal light. They are remarkably heavy, according to size, and very complete for age. The admirable specimens shown at Birmingham fat show as under six months prove how capable they are of early maturity. The coat varies as to length and character; we have the thick short staple and the long curly sort, which is not so closely set, but in no case have we strong, coarse bristles, which indicate a thick skin and slow growth.

During a young state, shelter, warmth, and care are it required. is not desirable to commence breeding until the halt is ten to twelve months old, care being taken that the litters are produced in spring and autumn, so as to avoid extremes of heat and cold. The halt should be kept well during the later stages of pregnancy; but an over-fat condition, which is so easily produced, should be carefully avoided. There is danger to the progeny if the organs are coated with fat, and the result will be a wretched, puny, and uneven lot; the sow will have difficulty in parturition, and the milk will be deficient. It frequently happens, especially when these precautions are not attended to, that the first litter are very small—four or five on an average, and these somewhat irregular as to size. It is as well not to retain any for breeding, but to select our future dams from a second or third littler, when the maternal powers of the sow are matured.

When fully grown, the small breed maintain their condition upon a minimum of food; indeed, a handful of palm nut meal in water or house wash suffices for their requirements.

The great value of the breed is for small pork on dairy farms. Nothing can be found so delicate, and for such purposes we can recommend their culture; also as centres from whence improvement on coarser sorts may be safely looked for. For general purposes—that is, to produce both pork and bacon, and especially the latter the small whites are not so well suited as other breeds. *London Field.*

WEANING COLTS.—The proper time for taking a colt entirely from the dam's milk will vary from three to six months old, according to circumstances. If a mare is a poor milker, and the foal is growing poor and smaller instead of larger, at three months old, it will do better to be taken from her and fed. Then, on the other hand, if a mare is a fine milker, and the colt growing and doing well, and the mare is not with foal, it will be an advantage to the coalt to run with her until it is six months old. Then again, whether the mare is a good milker or a poor one, if she is kept for breeding purposes, and is with foal, the colt should be weaned at from four to five months old, and at the farthest should not be allowed to run with her more than four months after the mare is again with foal. A foal weaned at three months old would be the better for a few quarts of cow's milk twice a day, fresh and warm. For the first ten days after being taken from the mare the colt should be shut up in a small yard and the mare removed to such a distance that they cannot hear each other's calls. After that the colt may be turned in an enclosure where there is good pasture. Always keep plenty of fresh water where colts can get at it, as they will be thirsty and drink small quantities often.—*New York Herald.*

WOOL SUGGESTIONS.—It will always be best for a farmer to produce wool of one sort or the other. Wool that is neither one thing nor the other, neither long nor short, will not usually command a satisfactory price so readily as if it were either the wool clipped from Merino sheep or from the backs of some long-woolled breed. An intelligent dealer in wool assures us that good delaine wool should be at least three inches in length, and be a round, strong staple. The practice of buying wool at an average price per pound, without regard to its quality and condition, is paying a premium for and encouraging the growth of poor and dirty wool, for grease and filth cost but a trifle per pound compared with choice, clean wool. Wool growers who raise wool above the average as to quality and condition can do better than to sell it at an average price by sending it to a reliable commission merchant, where it will be sorted and sold according to its merits. This is a safe and satisfactory way to sell good wool. It is not to be expected that wool buyers will advise farmers to thus dispose of their wool, for it deprives them of all the commission for buying, besides some twelve cents per pound extra in addition for all the delaine wool they sort out.—*New York Herald.*

INFLUENCE OF MENTAL IMPRESSION ON THE MALE.—A *Country Gentleman* correspondent writes:—In Switzerland you will find the cattle all brown in one canton; in another all grey; and you may happen to learn that no bull is allowed to serve a cow which differs in color from the herd to which the bull belongs; and you may smile, as I did, when told that such intercourse would affect the color of the subsequent get; but your incredulity will only elicit stronger assurances that such is the fact. On the 20th August, 1873, my Jersey bull Lord Lawrence, dark gray, without a white hair (his dam Lady Mary also solid gray) served a cow of broken color. An hour or so later he served imp Blondette, a solid lemon fawn, whose calves, as far as I know, had been invariably of uniform color, with black points. On May 27, the first named cow dropped a heifer calf nearly solid; and an hour later Blondette calved a bull calf flecked all over with white. It recalled the almost forgotten assertion of the Swiss herdsman. Could a mental impression received by the bull from the first cow have been transmitted to the calf of the second? Is there a herd witch who parodies her sister in Macbeth with

"Fawn spirits and white,
Dark spirits and gray;
Mingle, mingle, mingle,
You that mingle may."

# The Dairy.

## Soft Butter.

EDITOR CANADA FARMER:—What is the reason that I cannot make good firm hard butter? I have plenty of ice and a cool place, and the weather, though hot, is not hot enough to cause all the trouble.

C. H. A.

Essex Co.

There may be twenty reasons at none of which we can do more than guess. The most likely thing is that one of your cows is diseased, and her milk is at the bottom of the trouble, that being enough to spoil the butter from a whole herd. If there is one of the cows that is not looking well, do not use her milk, and notice if the trouble abates. Nor use the milk of an old and debilitated cow, for her milk will partake of her nature. Let the cows have abundance of rich and nutritious food, and water them regularly twice a day. Indian meal is said to have the effect of making the butter firmer. If it does, it is probably due to the fact that it is so much extra and nourishing food given to the animals.

## Making Butter.

We will take it for granted that you have good cows, good pasture, and a good cellar. With these requisites, perfect cleanliness, and proper attention, any woman of good judgment can become a good butter maker, though the quantity of soft, salty grease sold and consumed under the name of butter indicates that this is one of the "lost arts." We frequently read directions for making butter specifying the kind of pan to be used, depth of milk in pan, length of time milk should stand, etc. These rules may be necessary in a large dairy, but as farmers' wives are usually situated, the observing of them would be difficult at least. Use crocks or pans, as convenient (pressed tin pans holding about six quarts are light and nice, and I think the best), cooling them before straining the milk It is impossible to tell just how long milk should stand before skimming, as it depends much on the state of the atmosphere. Probably the best time is just after the milk thickens or curdles. Stir the cream in the jar thoroughly at least twice a day You will find it necessary to churn three times a week, or oftener Wash your butter well, and salt to suit the taste. Then set in the coldest corner of the cellar till next morning, when it should be worked again. If intended for present use this is sufficient; but if you wish to keep for a long time, after a few days, work again, and yet again, until there is not a suspicion of buttermilk. Then pack it solidly in stone jars Lay a cloth covered thickly with salt on top of the butter. This excludes the air, and also absorbs any water left in the butter. Be sure, in warm weather, that you choose the coolest part of the day and premises for all of these operations, and you will, I hope, succeed in making and packing butter, even in the hot months, that will be good and wholesome.—*Chicago Inter-Ocean.*

## The Exhaustiveness of Dairying.

Whether, says Alexander Hyde in the New York *Tribune*, a pasture is impoverished at a slow or speedy rate depends upon the kind of stock kept upon it, and the treatment of this stock. Young growing stock exhaust land much more rapidly than old cattle, as the former are making bone and muscle, while the frames of the latter are already built Pastures grazed for fattening purposes hold out much better than those kept for the dairy business, as the production of fat, being a carbonaceous substance, is not an exhaustive process. Milk, on the contrary, is rich in saline material, and this must come from the soil The analysis of the ash of a thousand pounds of milk gives on the average the following constituents:

| | Pounds. |
|---|---|
| Phosphate of lime | 2 87 |
| Phosphate of magnesia | 0 53 |
| Oxide of iron | 0 07 |
| Chloride of potassium | 1 63 |
| Chloride of sodium | 0 29 |
| Free soda | 0 44 |
| Total | 5.83 |

The milk of a cow may therefore be calculated to carry off from a pasture some twenty to thirty pounds of these precious salts, and unless they are returned in some form the land must be exhausted sooner or later. No matter how rich a deposit a man may have in the bank, if he makes daily drafts without making new deposits, the Cashier will finally tell him that his credit is gone. The soil is the farmer's bank, and cows are continually making checks on this bank. If the soil is rich the checks may be honored for a series of years, but not forever. A continual outgo, with no income, will bring the richest farm and the richest farmer to bankruptcy. This is true of the pasture, no matter what kind of stock is kept. Fat cattle will not bankrupt a pasture as quickly as milch cows, but with every ox or steer sold goes off a greater or less amount of the marrow of the land, and the same is true with every fleece of wool or carcass of mutton exported from the farm. No wonder that our pastures are exhausted that have furnished tons after tons of milk, beef, and wool. If they are now overgrown with bushes, weeds, and moss, a bountiful Providence is not to be blamed. The blame lies nearer earth than Heaven. Nature always does her best. If she cannot produce timothy, or red-top, or white clover for the want of the raw material with which to manufacture these nutritious grasses, she does the next best thing, and grows such herbage as she has the elements to produce.

## Milk and Butter in Cellars.

Milk or butter may be kept in a cellar the bottom of which has been grouted, and with good results, if proper attention be given to ventilation, drainage and temperature. When the ground is not of a character to afford natural drainage, drains should be laid so as to carry off all accumulations of water liable to occur at any time at the bottom of the cellar, and this should be done before grouting By so doing, dampness from the floor is avoided, as well as impurities from stagnant water under the grout. If milk is to be kept in the cellar for the purpose of getting the cream and for butter making, means must be taken to have the temperature of the room as low as 60° Fahrenheit Unless some one of the devices now in use for reducing the milk to a low temperature be employed, such as the large pan system, where flowing water is carried under the milk, or where the ice system and its modifications are adopted, there should be good ventilation to carry off stale air or noxious gases, as milk absorbs taints that will prove injurious to the butter.

We have seen excellent results from milk cellars having grouted floors, the walls being nicely plastered with water-lime cement and the floors made smooth and level with the same, and presenting the appearance of an immense block of stone.

We should not advise butter and milk to be kept in the same apartment. A butter cellar should always be kept by itself It should be properly ventilated and used for no other purpose than for keeping butter. And so with the milk cellar, it cannot be used for storing vegetables, or for the meat and soap barrels, or for fish and other family provisions. Milk and butter are dainty aristocrats in their nature. They are extremely fastidious about coming in contact with filth and anything having an unsavory odor, as such contact speedily demoralizes them, and when they once become tainted, they go on from bad to worse, apparently having no disposition or power for reformation. So the dairyman should be careful and not introduce them to bad company.—*Rural New Yorker.*

## Colour and Richness of Milk.

From a pamphlet recently issued by H. A. Mott, E. M. Ph. B., of New York, in which he investigates the general question of milk and the causes and conditions affecting its constitution, we make the following extract:

Another peculiar feature in respect to the composition of milk is that it varies in richness according to the colour of the subject from which it is produced, thus, in the human race, the milk of brunettes being richer than that of blondes. Mr. Mott gives a table drawn from the different analyses made by L'Heritier, in which the most marked differences are presented, as in the following:

| | Blonde. | | Brunette. | |
|---|---|---|---|---|
| Water | 89 20 | 88.15 | 85.33 | 85.30 |
| Milk solids | 10.80 | 11.85 | 14.67 | 14.70 |
| | 100.00 | 100.00 | 100.00 | 100.00 |
| Fat | 3.55 | 4 05 | 5.48 | 5 63 |
| Caseine | 1.00 | 0.95 | 1.62 | 1.70 |
| Milk sugar | 5.85 | 6.40 | 7.12 | 7.00 |
| Mineral salts | 0.40 | 0 45 | 0.45 | 0.45 |

"It will be seen," he says, "from these analyses that the milk solids in the milk of the blonde was only 10.80 per cent. and 11.85 per cent., while in the milk of the brunette the milk solids amounted to 14.67 and 14.70.

"If a mean of all the analyses made by L'Heritier bearing on this point be taken, the difference between the amount of solid constituents in the two cases would be less marked, but they will show quite a difference, the average ratio being 12.0:13.4. The researches of Vernois and Becquerel indicate a greater proportion of most of the solid matter in the milk of brunettes, with a very slight difference in the proportion of butter in favour of the blondes. The milk of brunettes contained 4.65 per cent. of milk-sugar; of blondes, 4 47 per cent. And they found 0.3 per cent. more caseine in the milk of brunettes than that of the blondes."

In the following table he gives the comparison between the milk of the African race with that of the Caucasian:

| Constituents. | Coloured woman's milk: average of 12 analyses. *Muntz* | White woman's milk: average of 30 analyses. *Vernois & Becquerel.* | White woman's milk: average of 14 analyses. *Simon* | White woman's milk: average of 14 analyses. *Tidy.* |
|---|---|---|---|---|
| Water | 86 54 | 88.908 | 88.36 | 87 806 |
| Milk solids | 13 60 | 11 092 | 11 64 | 12 194 |
| | 100 00 | 100 000 | 100.00 | 100.000 |
| Fat | 4 03 | 2 666 | 2.53 | 4.021 |
| Caseine | 3 32 | 3 924 | 3 43 | 3 593 |
| Milk sugar | 5 71 | 4 361 | 4 82 | 4 295 |
| Inorganic salts | 0 60 | 0 133 | 8 23 | 0 285 |
| | 13 66 | 11 092 | 11 64 | 12.194 |

It will be seen by comparing the analyses given in this table that the milk of the African race (or coloured woman) is far richer in milk solids particularly milk sugar, fat and inorganic salts than the milk of the Caucasian race (or white woman).

A question of some interest is suggested from the above, and this is, does the colour of animals have any influence on the quality of milk yielded? We know that milk varies in quality in different breeds, and indeed in different animals of the same breed; and it has been observed, also, that cows yielding very rich milk have a yellow skin Indeed, so generally understood is this last characteristic, that yellowness of skin has come to be considered a sure indication of a good butter cow. But does the colour of the hair indicate any peculiarity in the composition of the milk? So far as we are informed, we do not think that any investigations have been made in this direction, though among a great many farmers there is a prejudice against black haired cattle as yielding an inferior quality of milk. But if the rule applicable to the human race in regard to the conditions influencing the quality of milk hold good also in animals (and it does seem to do so in most respects), then black haired cows would yield milk containing more milk solids than white cows.

It will be seen from what we have said that there are some curious things concerning milk which are not well understood even by those who have paid considerable attention to the subject.

MILKING MACHINES.—A short time ago a correspondent enquired about milking machines. In addition to what we replied the following from the *North British Agriculturist* will be interesting:—Allow me to state that I tried what I believe to be the ordinary milking machine, in a dairy of 35 Ayrshire cows about nine years ago. I first ordered one and was so well pleased with its apparent efficiency that I at once ordered a few more, and the greater part of the milking was done for about a week with them, when I found out that the yield of milk and weight of curd had been gradually decreasing the time they were in use, so I at once put them aside and resumed hand-milking, when the yield soon increased to what it formerly was. This has been my experience of milking machines, and I consider their failure mainly caused by the total absence of any mechanical action on the teats or milk vessel, and not to the smallness of the tubes, as supposed by Mr. Littlejohn—a very simple defect which, if it existed, could easily be remedied. The young of all mammalia when sucking, by butting with their nose and pulling, bring a considerable amount of mechanical force to bear upon the teats and vessel. For instance, who has not observed a young pig when it could find nothing in the teat, butt and rub with its little nose all round about it till it got its reward? In these days of dear labor, when the most indifferent class of dairymaids can scarcely be got either for "love or money," the Highland and Agricultural Society would be doing a duty that would be highly appreciated by all dairy farmers were they to offer a handsome premium to the inventor of a thoroughly efficient milking machine.

A NOVEL DAIRY.—About seven miles north of Napa City, California, Mr. Jesse Grigsby has a butter dairy, and the following plan for controlling the temperature in his milk house is given by the Napa *Register*. It says the dairy, though small, is one of the cleanest and best arranged in the State. The milk house is constructed with a view to coolness and perfect ventilation, and consists of a building within a building:—"The outer is a frame house, 14 by 26 feet, and is one story high, and within this is another house, 10 by 18 feet, the walls of each building being quite thick, with a free passage-way between the walls and roofs of the houses. In the inner house are the racks on which are placed the pans of milk." The dairy consists of twenty-three cows, which are now fed in a barley field about one third of each day, and are then turned into a large field of alfalfa, where pure water is plenty, and, as a consequence, says the editor, "the cream from the milk is very rich, and the butter is of a superior quality."

# Veterinary.

## Ring Bones.

This term is applied to the osseous deposits which are found upon the upper and lower pastern bones. Ring-bones are of two kinds, true and false. False ring-bone is an exostosis or bony growth situated above the middle of the *os suffraginis*. The true ring-bone is of a more serious nature, and it is an unsoundness in every sense of the word. There are two kinds of true ring-bone, viz., high and low. It is called high when it involves the pastern joint; low, when it affects the coffin joint. In many instances both forms exist at the same time.

Ring-bone must not be confounded with what is known as side-bone. The first is a disease of bone; the second is a disease of fibre or cartilage. Ring-bone, whether high or low, varies in size, but the degree of lameness does not depend upon the size of the new formation. An animal is sometimes very lame with but little osseous deposit. Another with a very large deposit may show but little lameness. Very often the segment of the ring is not complete and the enlargement may appear only on one side of the limb, *or on both sides, without any prominence in front.* When situated on the sides, they do not cause the same amount of lameness as when the front is involved.

Ring-bones are not the cause but the result of disease, being the effect of inflammation originating in the extremities of the bones or of the synovial membrane. Or it may have its origin in the *periosteum*. As a rule they are the result of *ostitis* commencing in the cancellated structure of the bones, the areolæ of which first become filled with an organizable lymph which becomes converted into bony material. During the progress of the inflammation, the articular cartilage and laminal layer of the ends of the bones become removed by absorption, while, external to the joint, active deposit of bony material is going on for the purpose of repairing the damage done within. In some instances the disease may commence at the inferior extremity of the *os suffraginis* and gradually affect the articulation and *os coronæ*; when affecting either articulation or shaft of a bone, it causes lameness at its commencement, but when *anchylosis* is completed, such lameness may partly, if not entirely, disappear.

The gait of a horse lame from this cause is characteristic. If in the fore extremity, the heel is the first to come to the ground; but if situated in a hind extremity, the toe is the first to touch the ground. From this peculiarity in putting the feet to the ground, it is apt sometimes to be confounded with *laminitis*, seedy toe, or inflammation of the coronary band. It differs from *laminitis* by the absence of pain at the toe, freedom from fever, and by the heat being confined to the upper part of the foot only. If we examine the foot we will soon determine whether there be a seedy toe or a sandcrack; and the absence of the striated appearance of the wall of the foot will distinguish it from inflammation of the coronary band.

The causes of ring-bone are hereditary, structural, incidental and rheumatoid. Hereditary predisposition has been sufficiently proven and acknowledged. I would therefore advise breeders of horses never to breed from sire or dam having *exostosis* or bony growths upon them, unless they can be traced to some accident. The structural tendency to ring bone is manifested in horses with upright pasterns. The pasterns when long and oblique in position receive the superincumbent weight in such an indirect line that, bending towards the ground with the fetlock, nothing like concussion or jar follows. The reverse of this however is likely to happen every time the foot of a limb having a straight and upright pastern comes to the ground. In it, instead of the weight descending obliquely, it descends directly upon the pastern bone, producing a certain amount of concussion at every step.

TREATMENT.—In the first place we must reduce the inflammation in the part as far as possible before we resort to any very active treatment. This may be accomplished by giving a purgative or diuretics and the application of cold water to the affected part for an hour, three or four times a day, for ten or twelve days; after which we may apply counter-irritation either by strong blisters or the actual cautery. If in the fore feet, the horse should be shod with thin-heeled shoes. If in the hind, the shoes should be thick at the heels. A run at grass for five or six months with this treatment will generally remove the lameness; if not, we must resort to neurotomy.

J. G. ALEXANDER, V.S.

Mono Road, Ont.

## Exhibiting a Draught.

In the veterinary department of the *Prairie Farmer* Dr. Paaren records the following sensible, philosophical and humane manner of drenching horses:—

The methods of holding horses during the exhibition of a draught are various, but the most important ones are these. *In the first place*, by ropes and pulleys, a horse's head is pulled up from a beam or other high object in a stable or shed. This is very objectionable, especially in a vicious horse; and we have never found it to answer better than the *second manner of introducing a rope noose over* the upper jaw. This noose is attached to a stick, or slipped over a stable fork, and a man can then hold up the head of the heaviest horse and follow him in his movements. *It requires management.* We do not like the fork, as it is a dangerous instrument, and prefer an ordinary twitch. The third manner of holding a horse's head up and exhibiting a drench, is the most simple and useful method. *It only requires one person, who holds the tongue, places his* thumb around the lower jaw, and with his fingers causes the horse to open his mouth while the draught is poured out of the horn with the right hand. In cases of

LOCK-JAW OR TETANUS,

it is difficult to exhibit even fluid medicines to a horse. There are two useful methods, however, to accomplish this. The first is by the introduction of a tube into the œsophagus through the mouth, and the second is by pouring or pumping the fluid through the nose. The objections to the latter procedure are not so weighty as at first may appear, provided the fluid is a perfect solution (containing no powders or solid particles), and poured down the interior or posterior *meatus* with care and in small portions. Usually the internal exhibition of remedies by the nose is effected by means of a stomach pump with a long flexible tube. Under ordinary circumstances, drenching through the nose in the manner it is commonly done, should be avoided, as it is connected with danger, and especially so, if the fluid contains powders or sediments of any kind. We prefer the form of ball for the exhibition of medicines to horses. Draughts should not be too bulky; if possible, not nauseous, and not so astringent as to interfere with animals swallowing. Mixtures are given from bottles made of glass, tin or other material, or from horns. The latter are much to be preferred. The objections to the bottle form is, that from a narrow neck the liquid does not flow steadily and at will from the difficulty with which air enters a narrow neck to displace the contents of the bottle.

The rules to observe are:—1. Hold the horse's head up at a moderate height, so that the line of the face is horizontal—not higher. 2. Secure the tongue to prevent the lapping out of the fluid, but allow of sufficient movement of the lips, tongue, cheeks and jaws, so as not to interfere with the first act of swallowing. To draw the tongue forcibly outward is very injudicious, as if the tongue be stretched it does not aid in pressing back the fluid, which gravitates as the tongue is pulled upon, and the larynx and pharynx advance; the animal may thus be choked, as the fluid will run down into the windpipe. 3. If an animal makes an effort to cough, rather loose the draught than risk the danger of suffocation, which so readily occurs if the fluid be suddenly thrown over the tongue; not more than a tumblerful should be poured into the mouth at a time, when that is swallowed more may be given. 4. Entice efforts of swallowing should the horse obstinately and artfully retain the liquid in the mouth. This is effected by manipulating the throat gently and exerting pressure in the hollow between the lower jaws.

## The Working Horse in Hot Weather.

### Summer Colds.

Amongst horses "summer colds," as they are commonly styled, are frequent. The animals, exhausted, overheated, and perspiring, are often allowed to stand out to "cool down rapidly," perhaps in a draught; and hence sore throats, and even congested lungs, are more common than might be expected at this season. Horses require about as prompt attention and careful grooming in hot summer as in cold, wet, winter weather. The heated, tired horse is as much refreshed as his master by a bath, by rapid sponging all over, by careful drying, a comfortable airy box or stall, and a draught of water cautiously given. There is nothing special in the treatment of these summer colds. Mustard is applied to the tender irritable throat; mashes or green food should form the principal diet; some saline mixtures usually suffice for physic, but if the mouth is hot and noisome, the mucous membrane yellow, or symptoms either of fever or of gastric derangement are discoverable, a small dose of aloes should be given.

### Diarrhœa.

But the overheating and injudicious cooling down, the thirst which profuse perspiration engenders, with the copious draughts of water which the parched, wearied animals greedily swallow, are apt to disorder the bowels and produce diarrhœa. Semi-fluid discharges of imperfectly digested matters are passed; the patient is thirsty; if he is kept at work, or allowed to indulge in copious draughts of cold water, colic pains will set in, his appetite will fail, his pulse and temperature increase, and his successful treatment will be difficult. In the ordinary, simpler cases of diarrhœa in horses it is unwise at first to attempt suddenly to check the discharges, which are often a curative effort to wash away offending matters from the bowels or blood, and which are spontaneously abated if the patient is kept perfectly quiet, fed on digestible, dry food, encouraged to drink starch gruel, and for a couple of days restricted in his quantity of cold water, of which, however, a few mouthfuls may be offered at intervals of every two or three hours. A piece of whiting in his manger will usually be readily licked, and will help to counteract the acidity which usually occurs in such cases. When quiet and suitable diet do not in a day abate the bowel complaint, some further measures must be taken to arrest the outpouring of fluid from the irritable and relaxed bowels, and for this end nothing is more effectual than the familiar chalk and opium mixture. A very good formula consists of an ounce each of laudanum and sweet spirit of nitre and half an ounce of prepared chalk, beat up with an egg, given in a pint of well-boiled wheaten flour gruel, and repeated three or four times a day until the scouring ceases.

Many of these cases of gastric derangement, and indeed a large proportion of the sickness and mortality which befall horses, as well as the other domestic animals, during the summer months, depend upon the water supplies being defective, usually both in quantity and quality. Pools, brooks, and wells get low. They are in too many instances apt to contain an increasing percentage of decomposing organic matters. To the presence of such contaminations are due the cases of typhoid fever and purpura which have recently occurred in some studs of horses, and the outbreak of black-quarter which in various localities is recently reported amongst cattle and sheep.

### Galled Shoulders.

The hot weather brings with it still another class of cases amongst hard worked horses. Collars, saddles, and other portions of the harness get dry and hard, the steeds perspire freely, and are perhaps not over-well groomed, acrid secretions are carelessly permitted to accumulate on skin and on the harness; nature resents such treatment, the skin gets frayed and irritated, and there occur cases of saddle or harness galls, or what are technically called erythema. Unless attention is given to clean the harness, remove pressure, and foment tender swollen parts, ugly sores occur, and the horse must be laid off work. A careful man will avoid such troublesome contingencies by washing, cleansing, and, if necessary, repadding his harness, washing and grooming his horses properly, and moistening any tender irritable parts with an astringent solution made with an ounce of sugar of lead to an ounce of linseed oil.—*North British Agriculturist.*

## Abortion.

This affection, which is most commonly witnessed among cows, is presented in three forms, each calling for special treatment. The results of abortion vary in accordance with the stage in the period of gestation. The longer the duration, the more extensive is the connection between mother and fœtus, as well as means for the establishment of proper expulsion at the required time. When, therefore, circumstances of an extraordinary character are productive of abortion, the effects are in direct proportion to the stage at which it has been induced. In early cases the system suffers but slightly, and our interference is mainly required for the prevention of farther disease among our animals. In more advanced stages of pregnancy, a great depression, or high febrile action, may require strict attention; and in the latest mal-position of the fœtus, or closure of the *os uteri* (mouth of the womb), with a corresponding non-relaxation of the pelvic ligaments, &c., may occasion difficulty in the premature labor, or want of tone in the uterus may retard the delivery.

The treatment of animals that have aborted consists in the combatting of high febrile action by sedatives, derivatives, &c., and depression by diffusible stimulants. Vaginal discharges should be removed regularly, and the parts treated by injections of antiseptic fluids. The animal should be isolated, and the disposal of fœtus and membrane secured by prompt and effective burial. If the membranes are retained, they should be removed before putrefaction commences. In the cow no inconvenience arises from their retention during a few days; but if not removed in the mare, constitutional disturbance may be observed at an early stage. Vegetable tonics and stomachics are advantageously exhibited with stimulants in the cow, to promote their removal. Enemata and laxatives should be used to clear the bowels and promote a proper action, and ecbolics to assist in the contraction of the uterus and expulsion of the contents where want of tone exists.

In premature labor attended with closure of the mouth of the womb, dilation must be had recourse to. If the fingers fail to effect an entrance, or relaxation is very tardy, give chloric ether, belladonna, &c., by the mouth, and carry up the vagina a sponge saturated with the tincture or watery extract of belladonna, which should be allowed to remain for some time, the fingers being applied at

intervals to test and assist the relaxation. If the impediments consist of mal-position or mal-formation of the fœtus, embryotomy will probably be required. The greatest difficulty frequently exists in such cases, which arises from insufficient room for operating.

In order to prevent further abortion in a herd, the cause must first be ascertained. Noisome odors from putrefying material, giving rise to excitement, should be dissipated by disinfectants and burial; rampant animals removed; deleterious plants should be sought for and pastures changed; bad food or irregular diet creating indigestion discontinued, good food and proper system being established; highly plethoric animals should be reduced by derivatives, and, perhaps, venesection, &c., drastic purgatives being scrupulously avoided. A poor pasture is probably not the least valuable acquisition in such cases.—*Prairie Farmer.*

## Concerning Hog Cholera.

### No "Certain Cure," but Plenty of Prevention

Word comes from the Western States of "hogs dying by the hundred," of cholera, and there is anxious call for a "certain cure." No such cure is known—all fail when subjected to a sufficient trial. In years when the malady is milder and less virulent than at present many seem to have recovered under a laxative, partly vegetable diet, the use of antiseptics (carbolic acid, charcoal, ashes, copperas, &c.), castor-oil, to overcome the costiveness often present in the early stages, and the continued use of febrifuges (Saltpeter, ½ dr.; bisulphite of soda, ½ dr.) twice daily in the food. But in a year like the present such measures are eminently unsatisfactory, and the search after specifics and consequent preservation of the sick animals (fertile manufactories of the contagion), are above all else calculated to spread the disorder.

The rational course is to attempt prevention. Separate all sick hogs to a pen as far as possible removed from the others, and as soon as one is seen to be drooping, transfer him at once to the hospital pen. The use of a clinical thermometer, introduced two inches into the rectum, will greatly assist in distinguishing the sick, as the body temperature is often raised by one or two degrees for some time before any other symptoms of illness are shown. Both pens, together with all the droppings, but especially those of the sick, should be frequently and profusely sprinkled with a strong solution of crude carbolic acid, copperas, or chloride of lime, and the feeding troughs and drinking places should be so constructed that it is impossible for the animals to get their feet into them. If the sick animals are kept alive after the disease is unequivocally developed in them, they should have a separate attendant who is never allowed to go near the hog-pen or the food or litter stores used for the healthy, and all other persons should be rigidly excluded from the hospital pen. Shade and water are essential, and it is often desirable to change the location of the hog-pen used for the healthy, as a thorough disinfection becomes very difficult, and this process in unprofessional hands is liable to be imperfect. Much care is wanted to secure perfect purity of food and water, especially to avoid water that is stagnant or charged with the drainage of pens or yards or with other decomposing organic matter. Avoid crowding of the hogs in filthy dunghills, rotten straw stacks, or in dirty, confined cellars under barns. Success with such a malady will depend on maintaining the systems in such a state of health as will make them an unsuitable field for the reception and growth of the poison, and in preventing contact with this poison in any possible way.

Good sound, slightly laxative food, cleanliness in the hog-pen, and above all in the feeding troughs and drinking places, the free use of disinfectants, and the prompt separation and thorough seclusion of all sick pigs are the main points to be attended to. In excluding the poison a thousand minor conditions demand attention. Though not usually carried far in open running water, it is manifest that it may be floated along streams for considerable distances upon dry floating materials, and though a fence will sometimes form a sufficient barrier to its progress, yet in other cases it may be carried by the wind for miles when lodged on dry, light materials (straw, hay, paper, &c.) Tame and wild animals (dogs, cats, rabbits, woodchucks, skunks, &c.) and even birds may carry it from place to place upon their feet and limbs, and human beings, above all, pig dealers and butchers, are especially dangerous, as they often pass directly from the sick to the healthy herds and handle the one after the other. The great desideratum in regard to this as to other fatal contagious diseases is to convince people of the preeminent dangers of contagion and to shut up all the loopholes through which this may take place. To treat each sick pig scientifically would require as much skill and care as would the same number of human victims of typhoid fever. The only reasonable hope is in checking the diffusion of the poison.—*Prof. Law, in N. Y. Tribune.*

A USEFUL INVENTION.—M. Defay has discovered a preparation, by means of which sand-cracks or fractures in hoof or horn may be durably cemented up. Even pieces of iron can be securely joined together by its means. The only precaution necessary for its successful application is the careful removal of all grease by spirits of sal-ammonia, sulphide of carbon, or either. M. Defay makes no secret of its composition, which is as follows: Take one part of coarsely powdered gum-ammonia, and two parts of gutta percha in pieces the size of a hazel-nut. Put them in a tin-lined vessel over a slow fire, and stir constantly until thoroughly mixed. Before the thick, resinous mass gets cold mould it into sticks like sealing-wax. The cement will keep for years, and when required for use it is only necessary to cut off a sufficient quantity and re-melt it immediately before application.—*English Live Stock Journal.*

BRINE FOR HORSES' FEET.—I have tried strong brine on foundered or hoof-bound horses, and with good results. I made a solution of salt and applied it three times a day by washing the legs and pouring upon the bottom of the feet, and holding them up a few minutes to let it strike in. I saw the wonderful effects in a few days. I account for it in this way: Salt will extract moisture from the atmosphere, which keeps the feet moist. Salt operates nearly like grease upon the foot. The hoof becomes soft, yet pliable like a chunk of wood saturated with salt or brine, it is tough yet moist. Thus it is with the horse's foot. Here let me add, that the practice of rasping a cracked hoof to toughen it is all folly. Apply brine, and you will effect a cure. A horse that is driven upon a hard road is liable to get stiffened. I have seen valuable horses, driven upon our own plank roads a few days, get quite lame. I reasoned to myself as to the cause, and adopted the use of brine as a remedy, which proved effectual.—*Cor. Practical Farmer.*

HEAVES IN HORSES.—In heaves the great point is to correct any faults in feeding, watering and working. Keep the patient in a cool, clean, well-aired stable; feed sound oats or ground feed morning and noon, without any hay or straw, but at night a few pounds of well-cured timothy, or better, straw may be given after the grain; do not put to work for at least an hour after any meal, and let exercise be gentle for the first half hour; never overdrive; if there is any tendency to costiveness give daily two or three ounces of Glauber salts, more or less, as may be necessary to keep them easy. Without such careful management all other measures will prove unavailing, and this care alone may be sufficient to check the disease in its early stages. A run at grass on a natural pasture, destitute of clover, will often have a similar effect. Finally, the following powder may be given daily for a month or even more. Powdered digitalis, three drachms; powdered gentian, four ounces; powdered coriander seeds, four ounces; arseniate of soda, two drachms. Mix, divide into thirty powders, give one daily in the food.—*New York Tribune.*

RUBBING THE TAIL.—When I bought my first horse (a gelding), some two score years ago, I was told by the man (an old man) of whom I bought him that the horse was so constituted in his sheath that it would get foul, and must be cleaned out as often as once a month. This I must do with tepid water and a soft rag, and do it thoroughly. If I failed to keep the horse clean, irritation and fever would set in, ulcers and scabs would form on and near the roots of the tail, and to allay the itching he would rub his tail against anything he could, and in this state the horse would be restless and out of health. After one case of neglect one day I let my horse loose in the yard. On putting him in the stable at night I found that he had rubbed the hair nearly all of his tail for some six inches from his body. While in the yard he had found a knot on a fence post, just high enough from the ground for him to use. So severe was the itching and rubbing that the tail was quite bloody. Here I learned a lesson—to remember the advice of an old man. It required one year's time for the hair to grow again to its natural length.

Still further, I now own a very valuable gelding, that is fifteen years old, afflicted in the same way. Twice I have neglected to clean him sufficiently often to keep away irritation and the itching of the tail. Twice he has rubbed off the hair badly, and, of course, it disfigured him. When I have kept him clean in his sheath, which is more difficult to do in winter than when he is out in pasture in summer, there is no trouble about the tail, because there is no irritation or cause for it. The operation is a very unpleasant one at times, as the smell is very offensive, nothing more so, at least, to me, particularly if the sheath and foul matter has become much inflamed by remaining foul too long. A true sign to know when a horse is foul the rim of the sheath is swollen. There is no relief for the poor sufferer in his means for cure. He rubs his tail because he can get nothing better, and that he will do every day if he could until the cause be removed. To heal the tail after being rubbed, and to cause the hair to grow rapidly, I wash with warm water and castile soap and apply castor oil; lard will do, though not so well. I have owned many mares; they are never thus afflicted, because it is not their nature to be so; geldings only.—*New York Herald.*

# The Poultry Yard.

## The Gape Worm of Chickens.

This parasite lives in the windpipe and bronchial tubes of chickens, turkeys, pheasants, partridges, crows, woodpeckers, and many other birds. In young chickens and turkeys it often proves very destructive, by filling up the air passages, and thus quickly killing whole flocks. In some parts of this country at least three-quarters of all the young chickens and turkeys are sometimes destroyed by this parasite. The worms are reddish in color and have a smooth skin, but spiral depressions run around the body, giving it a twisted appearance. The reproductive organs show through the skin as slender, whitish, convoluted tubes. The males and females are almost invariably found united firmly together, the integument of the male soon becoming organically united to that of the female, so that the copulation is permanent for life. The females are very much larger than the males, becoming about three-quarters of an inch in length, and one-sixteenth of an inch in diameter. The anterior end, in both sexes, suddenly expands into a trumpet-shaped concave disk, in the middle of which the mouth is situated, surrounded by six small chitinous lobes; the posterior portion of the body of the female is more or less bent or folded, and suddenly narrows at the end terminating in a small point. The genital orifice is near the anterior part of the body, where the caudal bursa of the male is and conceals it. The male is only one-eighth or one-seventh of an inch long and very slender; the caudal bursa is simple, sucker like, with an entire margin, strengthened by about ten rays; the penis consists of two very small, cylindrical spicules, about 1-225 of an inch long. The eggs are oval, about 1-250 of an inch long. The embryos develop while the eggs are still in the oviducts and uterine tubes, and the eggs or young probably escape by a rupture of the integument of the body of the female.

The history of the young worms, after they are expelled from the windpipes of the birds, is not yet known, however. Possibly they may enter the bodies of insects to pass their larval state, but it is more probable that they bury themselves in the surface of the soil or other moist places, and are thus picked up directly by the birds and gain admittance to the windpipe by their own active motions.

SYMPTOMS.—The disease commonly known as "the gapes" is caused solely by the presence of numbers of these worms in the windpipe, which thus becomes so filled up as to render respiration difficult, and if in considerable numbers, by their growth the obstruction is complete, and death results from suffocation. Young chickens, thus attacked, seldom recover without special treatment for the removal of the worms. Chickens only three or four days old often show symptoms of the disease by opening wide their mouths and gasping for breath, and attempting to swallow. They also frequently sneeze. As the disease grows worse these symptoms become more marked; they continually gasp and struggle for breath, grow weak and dispirited, and finally droop and die. In fatal cases, one or two dozen of these worms are often found in the windpipe, completely filling it up.

REMEDIES.—The worms may be removed by a feather from which the web has been stripped, except a small portion near the tip. This may be moistened with oil, salt-water, or a weak solution of carbolic acid, and introduced into the windpipe, when if it be twisted round once or twice and removed, it will usually bring away several of the worms. The operation should be repeated at intervals until all the worms are destroyed. All worms removed in this or any other way should be carefully destroyed, preferably by fire, for the embryos are extremely tenacious of life, and if left upon the ground, are likely to spread the disease. For the same reason, those birds that are infected should be separated from the healthy ones, and poultry should never be allowed to run in the same yards or grounds, or be kept in the same houses where infected ones have previously been kept, unless the premises have first been thoroughly sprinkled with a strong solution of carbolic acid or petroleum-water, to destroy those old worms or the eggs and embryos that may have been discharged from the sick ones. The vessels from which they feed should be frequently and thoroughly cleansed, and they should be supplied with pure water, frequently renewed.

In extreme cases, the worms may be safely removed by a surgical operation; but this requires some skill. This is done by first carefully securing the bird, or still better by administering a few drops of chloroform, placed upon cotton and held to the nostrils. The skin of the neck is then to be divided with a very sharp knife, and the windpipe opened by a longitudinal slit about a quarter of an inch long. The worms may then be removed by a pair of small forceps or other suitable instrument. The incision of the skin may be closed by one or two stitches, and the

wound will generally heal in a few days. By this operation an almost instantaneous cure may be effected, even when the disease has progressed nearly to the point of suffocation; but in unskilful hands it is not likely to be so successful as the remedies already described.

## Management of Ducks.

There are four kinds of domestic ducks that claim our attention, viz.: Aylesbury, Rouen, Cayuga, and Pekin; each having its admirers. I do not propose to discuss their comparative merits here, but will simply state that, for good reasons, I prefer them in the order named. I have omitted Muscovys, because I have little to say of them. Their ugliness and destructiveness are beyond endurance, and I advise all who are unacquainted with them never to seek an introduction.

It is a mistaken idea that a pond or stream is absolutely necessary to success in raising ducks, for, although it is beneficial, it is not a necessity. Those who have a fondness for ducks can succeed with them without a bountiful supply of water, yet they will not thrive in confinement. If one has only a small yard he should not keep more than a pair or a trio, but a dozen or more may be kept with profit if they have the range of a pasture or meadow.

Ducks are great foragers, and should have good range. It is not enough to give them a pen extending into a pond or stream. They should be free to roam over fields, where they may be seen at early dawn seeking worms and insects, their favorite diet. When this can be allowed them they never should be fed in the morning. Feed only once a day, at night; then they will be sure to return for their evening meal, and may be penned up so as to secure their eggs, which are deposited at about daybreak.

The color of the eggs varies considerably. The first eggs of the season laid by Cayugas are generally almost black, and the color of the others is pale green, but they soon lose their shades and are a creamy white in color; although I have known Rouens to lay greenish-colored eggs throughout the season. This diversity of shade cannot be accounted for. The size of the eggs is double that of a hen's egg, very sure to be fertile, and they bear transportation splendidly. I have frequently sent them a distance of five hundred to fifteen hundred miles, and from 90 to 100 per cent. hatched; but only from two to four ducks are allowed with one drake. Perhaps that number may be increased to six or eight, but I have never risked it.

I have tried to hatch ducks' eggs under ducks, but have always failed; consequently I place them under hens and put several broods together. After they are hatched, ducklings should be kept in a dry yard, containing a good shelter. Never allow them free use of streams or ponds, till they are six weeks old. It is not necessary to feed them boiled eggs. I always use corn and oats, ground together, and wheat bran in equal portions by measure, mixed and scalded. Never feed raw mush. Ground worms are especially beneficial to ducklings, and should be supplied them every day if possible; if not, animal food should be given them in some shape. Beef liver or other cheap meat, may be cooked and chopped for them, and feed stirred in the broth while it is boiling hot. Thus nothing is lost. Never feed whole or uncooked grain to ducklings till they are well fledged; then alternate with cracked corn, whole corn, and other grain, once a day; but continue the soft food. If whole grain is fed them while young, a frothy substance appears in their eyes, the beak becomes sore, and death soon follows. You can get along without a bountiful supply of water, but not without animal food and soft food.

## Experiment with Poultry Manure.

I give the result of a little experiment made in 1858. I had been composting my hen manure with ashes, and applying it to my crops with very good results. But from what I had read I was almost certain that the course was wrong, and determined to set myself right. The hen manure was piled upon the barn floor and moistened with water, so that it would heat a little and become fine; I then added the same bulk of rich loam that had the wash of the barnyard and a small quantity of plaster. I took one bushel of this mixture and applied it to 140 hills of corn before planting, scattering it over a circle of at least one foot in diameter. No other manure was used on the plants. I then took three pecks of the above compost and mixed with it one peck of good ashes, and applied it to the same number of hills in the same manner. The corn was planted May 29, cut and stocked on September 8, and husked October 11. The portion with hen manure and ashes gave 109 pounds of sound corn and 7 pounds soft corn. I also planted 140 hills, with nothing in the hill, and got 84 pounds sound corn and 31 pounds soft corn. The hen manure increased the crop 72 per cent., hen manure and ashes 30 per cent. One-half bushel of hen manure made 35 pounds of sound corn on the cob, and this approximates very nearly the result I get from year to year by using hen manure. Thirty-five pounds of corn on the cob are worth at least 35 cents, which practically makes the hen manure worth 70 cents a bushel.

I have just weighed a bushel of hen manure from under the hen-roost, and find it weighs thirty pounds. According to Bruckner's analyses, a bushel of hen manure contains—

| | |
|---|---|
| Phosphoric acid, .045 lbs., worth 16c. per lb | $.072 |
| Potash, .0055 lbs, worth 7c. per lb | .004 |
| Nitrogen, .045 lbs., worth 30c per lb | .193 |
| Actual value of one bushel hen manure | $0.269 |

Another correspondent of the same paper says that from actual experiment he finds that one bushel of hen manure, well preserved in a dry hennery, is worth nearly as much as half a load of barnyard manure, if properly mixed and rightly applied. In the first experiment above related, it would have been better to use dry, sifted road dust, instead of the water-soaked loam, as an absorbent. Road dust is one of the cheapest, best, and most satisfactory of all absorbents.—*Cor. B. Cultivator.*

Hatching Time for Eggs.—Hens' eggs hatch in from nineteen to twenty-one days; turkeys in from twenty-six to twenty-nine days; ducks' in twenty-eight days; Guinea fowls in from twenty-five to twenty-seven days; pea fowls in from twenty-eight to thirty days; geese's in from thirty to thirty-two days. Fresh eggs will hatch one or two days sooner than those two or three weeks old.

Lice.—To keep chickens free from lice, use plenty of whitewash (good slacked lime), spread thick with a brush on the roosts, ceilings, nest-boxes, inside and out; in short, whitewash everything Remove all the droppings, and sprinkle the floor freely with wood ashes or air-slacked lime, and keep it dry and dusty. The nits hatch and swarm where the droppings are exposed to the weather and the fowls roost above. Where fowls lodge on trees in summer, their roosting places will become literally alive with lice. It is next to an impossibility to find any of the feathered race entirely free from vermin. All the birds of the air are more or less tormented with them.

Clipping Wings.—To prevent fowls from flying, cut the primary or flight feathers, in one wing only, but do not disturb the secondaries or wing coverts. This method will not mar or disfigure the bird in the least, and by so doing many high flying birds can be kept enclosed by an ordinary picket fence. When this method is followed the fowls must be provided with low roosting places or ground nests. Strangers, and anything that causes sudden fright, should be kept out of the yards, as the birds are crippled from flying, and in a good degree rendered helpless. Their efforts to escape are futile and only result in their beating themselves against their prison walls, and an exhaustion of strength to no avail. If they are well fed, kept quiet, with plenty of drink, gravel and greens, they will do quite as well as when at large, if their enclosures are roomy.

Scurvy Legs.—Scurvy-leggedness is a disease (if it may be called a disease) which attacks only white and yellow-legged fowls. I never saw a blue or slate color-legged fowl affected with it. Black or slate-colored legs are generally clean and neat. There are willow legs, black legs, slate legs, white legs and yellow legs. The latter are the prevailing color among the Leghorns, both white and brown, the Brahmas, Cochins and Dominiques. In the Leghorn, more especially brown, the color is frequently a bright orange, with red fleckings down the out-side of the leg. This is very noticeable in the cocks. Yellow legs are very handsome, and preferred by the majority until this plague (scurvy-leggedness) comes upon them. It is really no disease, but simply a collection of parasites under the scales of the legs. If left to its own course, warts and bunches will collect on the legs, which will nearly eat them off, becoming sores. If taken in time, they can be easily and effectually cured. Wash the legs once a day in strong soap suds, after which rub in a little oil to heal. Oftentimes the scales come off and new ones grow. Why it is that yellow legs are more subject to it than others, is more than I am able to tell, but one thing is certain: it is not wholly the production of filth, else why should not the blue legs suffer the same when treated the same? The Houdans are white-legged; the Spanish, the Hamburgs and some of the Games are black and slate-colored. The desirable shade for Games is willow. This difficulty should be taken in hand as soon as discovered. If left, excrescences or warts frequently form, the size of a large pea.—*Country Gentleman.*

# The Apiary.

## What to Do When Badly Stung.

It is not an unknown thing by any means for bees to attack a man, and so sting him that he dies from the effects of their venom. Mr. Dadant writes to the *American Bee Journal*:—Every bee-keeper should remember that when a person has received many stings the first thing to do is to remove the stings by slipping the edge of a knife on the skin. Pinching the sting with the fingers would empty the venom bag into the wound. The best way to prevent evil consequences is to envelop entirely the patient in a thick wet cloth, and to cover him with blankets in order to stimulate the perspiratory organs. A tablespoonful of common salt should be dissolved in the water to be used, then two or three spoonfuls of ammonia should be added and mixed. Care should be taken that the patient breathe not too freely the vapors of ammonia. To drink one or two drops of ammonia in a glass of water or tea would greatly prevent the swelling from spreading on the parts of the body that have not been stung.

## Effects of Stings.

Mr. G. Walker, of Wimbledon, England, has recorded an experiment he made on himself to try how long, and how many stings, it would require to get inoculated. He gives the following as the *modus operandi* and result, viz:

I went to one of my hives, caught a bee, placed it on my wrist, and allowed it to sting me, taking care that I received the largest amount of poison by preventing it from going away at once; then I let the poison-bag work, which it does for some time after being separated from the bee. The first day I only stung myself twice. A bee sting has always had a very bad and injurious effect on me, inasmuch as it has always caused a great amount of swelling and pain, in fact, once when stung on my ear, the part became so painful and swollen that I hardly got any sleep the following night, and it was three days before I recovered. The first few stings I got during this experiment had the usual effect, the whole of my fore-arm was affected with a cutaneous erysipelas, and there was disorder of the muscular nerves, accompanied with heat, redness, swelling, and pain. This attack lasted till Tuesday, and on Wednesday (October 7th) I was so far recovered that, following the same plan, I stung myself three times more, also on the wrist. The attack of erysipelas this time was not nearly so severe; but, as before, I felt a stinging sensation as far up as my shoulder, and I noticed that a lymphatic gland behind my ear had increased considerably in size, the poison being taken up by the lymphatic system. On Saturday (October 10th) I again treated myself to three stings, and the pain was considerably less, though the swelling was still extensive. At the end of the next week (October 17th) I had had eighteen stings; then I stung myself seven times more during the next week, and I reached the number of thirty-two on October 31st; the course of the experiment having lasted nearly four weeks. After the twentieth sting there was very little swelling or pain, only a slight itching sensation, with a small amount of inflammation in the immediate neighborhood of the part stung, which did not spread further: and I stung myself on November 8th, without its having any effect on me.

Parasites on Bees.—The *Rural World* reports that at the last meeting of the St. Louis Academy of sciences, Prof. C. V. Riley, the President, read a communication from G. W. Barnes of San Diego, Can., in relation to parasites found upon bees in that State. The parasite was described as the color of a flaxseed and easily distinguished by the naked eye. It appears usually under the wing of the bee, and adheres with considerable tenacity. It occasionally crawls all over the bee, and is quite agile in its movements. The bees afflicted with the vermin become agitated and move rapidly over the comb, frequently dying of injuries. The parasites we first noticed there last year, and have again appeared this season, giving considerable trouble in large apiaries. Specimens of the insects afflicted accompanied the letter, and Prof. Riley said the parasite was the larva of the blister beetle. It was well known that these larvæ attach themselves to bees and were thus carried into the hive, where they usually left the grown bee and attacked the larvæ. Prof. Riley had not before heard that these insects injured the fully developed bees. The information was valuable, if reliable.

Bee Enemies.—Dagden in his Bee Book says: "Never put a swarm of bees in an old hive, as there will almost certainly be the eggs of the honey moth deposited in the crevices of the hive, which will hatch out and probably destroy the swarm. Nothing is more to be dreaded by the bee keeper than the moth, and when they once gain an entrance to the hive the bees appear as if powerless to expel them, although they will seize them savagely at the entrance. When moths have once established themselves in a hive, and the maggots begin to eat their way through the combs, the sooner the bees are fumigated and put into another hive the better, as for them to remain with the moth maggots will be certain destruction to them. Moths as well as the large slug may be taken in great numbers, late on summer evenings, by spreading a mixture of sugar, home-made wine and rum, on the walls or the stems of trees."

The Canada Farmer

TORONTO, CANADA, SEPTEMBER 15, 1876.

## Beet Sugar.

There being now some revival of interest in beet sugar, and the failure of attempts to profitably manufacture the article on this continent having passed out of mind, an article just written for the *Western Farm Journal* is a timely one, and is especially valuable, inasmuch as the writer of it is speaking of what has occurred in his own experience. He says that investigations into the outcome of the experiments in beet sugar making in the United States will result in showing nothing but loss, whether in New Jersey, Illinois or Wisconsin. No more, however, than would be shown from the history of beet sugar manufacture, during its infancy, in any of the European countries in which it was undertaken. In California, if we may credit statements received, results have been satisfactory. In the manufacture of beet sugar a soil free from nitre is absolutely necessary to the cultivation of the crop. An abundance of water for working the crop—not less than fifteen cubic feet per minute—is indispensable. A large capital, not less than $100,000 to $150,000, is needed to erect the necessary buildings and place the machinery. It will require not less than one hundred hands to work the factory, for the labor must be uninterrupted, night and day. Skilled and cheap labor is necessary, both in raising the crop and in the factory. The pulp must be utilized in the feeding of stock, and a climate neither hot, or subject to violent alternations of moisture and dryness, is essential. The failure at Chatsworth, Ill., resulted from the large per centage of salt-petre in the product, which had to be washed out of the sugar at a great loss, before it could be made pure. Nevertheless, this was gradually being worn out of the soil, and, the last year's sugar made there was sold in Chicago, so pure that it brought, by the car load, on its merits alone, within one-eighth of a cent per pound, of that of the best New York granulated sugar. The final abandonment of the works resulted from the utter inability to obtain sufficient water to work the crop, and after the company had exhausted every available means in its procurement, including some $13,000 in sinking wells in the effort to obtain artesian water; the attempt having at last been abandoned after boring 1,327 feet, 1,200 of which was through solid limestone and flint.

Our Western contemporary continues:—We have but slight hopes that the present attempt to reinvigorate the manufacture of beet sugar in the United States will result in success. In its infancy in Europe it was not only protected largely but fostered in many ways, by the governments of the countries in which it was undertaken. Since it has been able to stand alone, and, particularly of late years, the industry has been taxed, and increasingly so, until now the tax exceeds the price per ton that would be required to raise the beets in the United States. On the other hand, the companies organized here had not only to labor under the disability of importing the machinery for the works, and pay duty thereon, but, also, had to depend upon such labor—not always that of experts—as could be procured for its manufacture. There is no question that we have ample scope of soil for growing a superior quality of beets; ample water privileges for washing and treating the crop, in the process of manufacture, and capital to carry the industry. We can also buy skilled labor. Nevertheless all these essentials must be first brought together, and a fair prospect of success assured, before capital will again undertake the industry. If it could once be made successful, it would become one of the most important industries in the United States.

## The Outlook for the British Farmer.

The question is continually arising, what is to become of the British farmer if foreigners can supply grain in England cheaper than it can be grown there? Judging by the present outlook such is actually going to be the case, and at no long distance of time. The proportion of wheat grown on this continent and sold in England has increased remarkably of late. As the West and our own Northwest are opened up, the probability is that the surplus for exportation will become larger, and will come to assume a greater influence than it now bears on the market price. The question we have propounded is usually answered by saying that less wheat will be grown in England, less labor employed, and more land put into permanent pasture—in fact that the Roast Beef of old England will be the financial salvation of the English farmer. But even in this direction the land seems to be sinking from beneath the feet of our friend across the sea. The past few months have demonstrated the feasibility of the English farmer being met in his own meat-market and fairly beaten. Of course the live and dead ocean meat trade is yet in its infancy, but it is an infancy which shows signs of an early and lusty manhood. As the business gets to be better understood, some of the difficulties in its way will diminish, and the competition of the steamship companies for this new and remunerative traffic will reduce expenses of transmit materially. In raising horses, too, Canadian and American competition will have to be provided against, and this with the long odds against the Englishman that the raising of good horses requires that the pastures on which they run should be of large extent and not impoverished of their bone-forming constituents.

"What is going to be done about it?" Why, the English farmer will have to take smaller prices, and must be relieved of some of his rent. But there is the rub. A diminution of rent means so much less income to some country magnate or other. A general fall of ten per cent. in the rental would bring down many a proud old house—would consign many a broad-acred estate to the auctioneer's hammer, so covered up with settlements, mortgages, and charges have they become under the laws of entail and primogeniture. And ten per cent. is but the beginning of it. We observe that the estimated depression in values has already reached that point. At a recent rent-audit Mr. R. N. Philips, who is a large Warwickshire landowner, reduced the rents of his tenants permanently by 10 per cent. on account of the depressed state of agriculture. Of course what will apply to his tenants will affect other tenants equally as much. If the depression is actually so great as estimated by Mr. Philips, it is only a question of time how long other landlords can avoid following his example. And recollect that this depressed state of agriculture is occurring under the rule of the strongest government that Britain has had for many a day—and that government a conservative one, and therefore certainly possessing the will to keep up rents, the party being nothing if not a landlord's party.

It is quite evident that the evil is deep seated. Land that is forced up in value by artificial legislation to fifteen or twenty dollars an acre rent, or more, cannot compete with a whole hemisphere of cheap lands whose only drawback is their distance from market, an obstacle which is daily getting less formidable. So English rents must come down and with them some of the landlords. By-and-by will follow the downfall of the whole rotten land-system that justly admits free-trade in the necessaries of life to be the greatest discovery of modern times, but at the same time inconsistently hedges around the dealings with the land, the most necessary of all necessaries, with vexatious restrictions, thus keeping up an anachronous mediævalism sadly out of place with the spirit of progress which ought to animate this latter fourth of the nineteenth century.

## The Coming Struggle for the Meat Market.

The British farmer is not going to surrender his home meat market without a fight. The alleged danger of the importation of foreign diseases is what he will rely on to keep out foreign cattle. The restrictions at present in force are most vexatious, and, in addition to being vexatious in themselves, are administered in a spirit as hostile to the importer as possible. The British farmer would make them still more so, and if he had his way, would prohibit the importation of foreign cattle altogether. Certain glib statisticians, whose ability to make figures lie cannot be disputed, even say that for every head of cattle imported into Britain at least one head of British cattle dies from disease brought in by the foreigner. The statement is proved by the ingenious and convincing process of putting on the left side of a piece of paper the value of the cattle imported into England, and on the right side an *estimate* of the estimated number of cattle that die an unnatural (that is not-by-the-pole-axe) death in England and drawing a supposititious balance from the two adverse to the foreigner. In fact the statement is a wildly exaggerated one, and is destitute of proof. And even if it were capable of proof, it is a notorious fact that cattle on the American continent are more healthy than anywhere. The danger of importing disease with Canadian or American cattle is infinitesimal. A rigid inspection at the landing stage is all that is necessary, the fourteen day voyage being a sufficient quarantine.

Some attention is now being drawn in England to the importation question by the issue of a Report from the Veterinary Department of the Privy Council. Judging from such parts of the report as we have seen, it is just to the importer. The *Daily Telegraph*, writing of course more in the interest of the manufacturing masses than of the farmers and landlords, says: "Of course we cannot have free trade in oxen as we have in corn. A sackful of continental wheat cannot produce a flour famine by introducing a contagious pestilence that will almost exterminate our home crops. But an ox from foreign parts may be diseased, and as a centre of infection it may propagate a malady that will perhaps decimate our native herds. To allow the indiscriminate importation of beeves and wethers from abroad might therefore in certain circumstances actually diminish rather than increase the straitened meat supply which such imports were meant to supplement. Sanitary restrictions must consequently be put on the trade; but in imposing them it must ever be kept in view that they are meant to have precisely the opposite effect of the old corn-laws. They are intended to prevent, and not create, a diminution in our food supply." But this is exactly what the English farmers do not want. They want the prices kept up and the foreigners out. The upshot of it will probably be that the farmers will have to give way, and the regulations to be modified.

It appears to be the opinion of the Privy Council that the attempt to extirpate the Foot and Mouth Disease (which is the principal disease complained of) is likely to prove more ruinous than the continuation of the disease. Foot-and-mouth disease is more disagreeable than dangerous. The chief losses arising from it come from the loss of flesh in the animals attacked. The deaths do not amount to one in a thousand cases. The regulations in force have proved insufficient to prevent its importation, and are, from that fact, useless and obstructive. Against cattle from this continent they are totally unnecessary, it being a matter of certainty that foot-and-mouth disease does not exist here at present, and a matter of doubt whether it could gain a permanent footing under any circumstances.

## The Leaves of Growing Roots.

In districts of France where the sugar-beet is grown for the purpose of manufacturing sugar, it is customary for the farmers to strip away some of the leaves from the roots for the double purpose of furnishing forage to their cattle, and of letting in air and light to the roots. A series of exhaustive experiments has been made with respect to the profitableness of this course. The result is so important that we give a condensation of the report. The practice is found to be a bad one in every way. We know of a farmer who being hard pressed for fodder last year fed his cattle part the tops of his growing crop of Swedish turnips and mangolds. We believe that in England it is a very common practice to pull off a portion of the leaves from mangolds. The French experiments, which were conducted by M. Corenwinder, will show that the profit derived by the feeding of the tops to cows is apocryphal, while the injury to the roots is positive and disastrous. The leaves are usually removed while the plant is in full growth. The French experimenter above named, looking at the matter

from a chemical point of view, perceived the injurious effects that were likely to follow such a practice, and determined to put it to the test of actual experiment. The leaves removed amounted to 257 kilograms (a kilogram is about one pound two ounces) per are (one are equals nearly 120 square yards). These leaves were supplied to cows, each of which consumed about 100 kilograms daily. The quantity of milk was, it is true, increased, but it was of inferior quality, watery, and yielded a relatively small proportion of butter.

From a square space of 100 metres 863 roots were taken, the leaves of which had had not been removed, these weighed, after the removal of the earth, &c., 865 kilograms. From a square space of equal dimensions, containing the plants from which the leaves were removed, 859 roots were taken, which weighed, on the whole, 719 kilograms, so that there was a loss in weight of 146 kilograms in the stripped roots, as compared with those from which the leaves had not been removed. Proceeding then to examine chemically the roots, the following results were arrived at: In the roots left to themselves there was a percentage (omitting fractions) of 85 of water, 9 of sugar, 1 of nitrogenous matters and cellulose, and a trace of mineral matters. Where the leaves had been removed the proportions were: Water, 88; sugar, 6; nitrogenous matters, 4; mineral matters, rather more than in the preceding case. It will be seen that in the stripped beet roots the smaller amount of sugar was replaced by a nearly equivalent quantity of water

In another series of experiments the leaves from a row of sugar beet were entirely removed, the roots being left in the ground for about six weeks, during which time they produced a series of small leaves round the crown. At the same time that the leaves were removed from the one set the roots of a similar number which had been allowed to grow naturally were lifted, and these were at once analysed. Six weeks subsequently the stripped roots were lifted, and ten of them were analysed to compare with the results obtained by the analysis of the unmutilated roots lifted previously. The principal results were that in the ten untouched roots the weight was slightly greater, and the sugar in nearly double quantities as compared with the mutilated roots. The roots thus lost in the course of 41 days, consequent on the entire removal of their leaves, 45 per cent o the sugar they contained at the time of removal of the leaves.

M. Corenwinder, then, is perfectly justified in stating that the removal of the leaves, as usually practised, greatly reduces both the yield and the quantity of sugar, at the same time that the salme matters are increased, and the increase of which latter corresponds with a diminution of both the quantity and the quality of the sugar. The diminished sugar in the roots of the mutilated plants is accounted for by the demands made upon them by the growth of new leaves round the collar. The carbonaceous materials required to build up these latter are doubtless derived from the sugar stored up in the root. To show the importance of the leaves in absorbing carbonic acid under the influence of solar light, M. Corenwinder grew under like conditions some small-leaved and some large-leaved beet-roots, and then analysed the two, to ascertain the proportion of sugar in each. The total weight of roots produced was the same, but while in the small-leaved beet the yield of sugar was 8 per cent, it amounted to 10 per cent in the large-leaved varieties.

In conclusion, it is shown that the leaves of the beet-root absorb and manufacture the elements necessary for the production of the sugar which is stored up in the root. One of these elements is carbon, which is principally derived from the atmosphere by the leaves, and, even if any be absorbed by the roots, it is by the agency of the leaves that it becomes utilized for the plant.

What will apply to beets in this respect will apply also to other roots. The leaves are necessary for the perfect development of the roots. Their removal results in a deficiency of the nutritive elements, while the part removed is of very little value for feed.

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THE FRENCH MINISTER OF AGRICULTURE has had posted in all the forest country the following printed notice:—"Ministry of Agriculture.—This placard is placed under the protection of good sense and public decency. Hedgehog: Lives on mice, small rodents, slugs, and grubs *(vers blancs)*: animals hurtful to agriculture.—Don't kill the hedgehog! Toad: farm assistant; destroys from 20 to 30 insects an hour. Don't kill the toad. Mole. Is continually destroying grubs *(vers blancs)*, larvæ, palmer worms, and insects injurious to agriculture. No trace of vegetation is ever found in its stomach. Does more good than harm—Don't kill the mole. May bug and its larvæ or grub: mortal enemy of agriculture; lays from 70 to 80 eggs.—Kill the May bug. Birds: Each department loses seven millions annually through insects. Birds are the only enemies able to contend against them victoriously. They are great caterpillar killers and agricultural assistants.—Children, don't disturb their nests. Children will be paid 24 centimes for every 500 May bugs placed in the hands of the garde champêtre."

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THE CHARACTER for honesty and general reliability borne by the Peruvian Government is about as odorous as the guano which it vends, and the false reports about which have brought the very name of Peru into contempt. The high-colouring of the Peruvian reports is so well known that we are not surprised to find the following in the *Irish Farmer's Gazette*:—A cotemporary states that there has been a solemn meeting in Lima of exalted Peruvian functionaries to open a sealed envelope presented by Senor Carlos H. Williams, containing a wonderful document announcing the discovery of new deposits of guano. They are said to be on three plateaus, and to cover a surface of 1,500 metres in length by 150 to 200 m width. In addition to this there are three small ravines near the port of Punta Grande, which is the place of shipment for the larger deposits, containing considerable quantities of the precious commodity. Speculation in Peruvians will probably revive on the strength of this wonderful find, which the discoverer modestly estimates at 3,000,000 tons. We are only surprised that it was not found ready packed up in bags, with an analysis enclosed in each, together with a certificate of the unimpeachable honesty of the Peruvian Government.

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ABOUT BLACK NOSES IN SHORTHORNS, a feature the desirability of which no breeder will contend for, while others will object to it more or less strenuously, there has been some disagreement among the Highland Society of Scotland. At the dinner of the Society after their recent show, Mr. Cochrane, of Little Haddie, whose Shorthorns did not get a prize because of the stain on their noses, said: "I have been a successful competitor, but I must say frankly not so successful as I would have liked. And I trust, Mr. Chairman, you will bear with me if I make first a single remark on one point. In the Shorthorn class in which I exhibited the judges took upon them to throw out all the cattle that had mottled noses. I believe I a right in saying that that was never done before; and I do not know for what reason the judges have done it. One can understand the objection to a black nose; but it is the fact, sir, that you will find slight spots on the noses of animals of the very highest breeding. (Hear, hear). I repeat that this course has never been taken before since I began to be a breeder and exhibitor, now twenty-five years ago. However, we are always learning something; and if the thing is decided to be correct it ought of course to be done, and in that case I will bow to the decision of the judges. As I say, we are learning every day, and this is a lesson read to us northern breeders that we did not know before, and which, I trust, we shall benefit by."

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DEATH HAS BEEN BUSY lately among agricultural celebrities. Among those who have gone to their last account is Hon. Henry S. Randall, the well-known author of works on sheep husbandry. His was a useful life and one of great activity. One of the best known of Short-horn breeders, Mr. C. C. Parks, of Illinois, is also dead. He was a native of Michigan, his parents removed to Waukegan in 1846, and his subsequent life was mostly passed at that place, though he was for some years engaged in business at Chicago and in the city of New York. The death is announced of John T. Alexander, the great cattle king of the Northwest, who died at Jacksonville, Ill., August 22, after a brief illness of some kind of bowel disease. His age was about 65, and he had been a resident of the state for nearly forty years. At one time the magnitude of his farming operations, when he owned 40,000 acres, made him the wonder of agriculturists. Serious reverses in cattle operations, several years ago, so crippled him as to compel the sale of all save about 7,000 acres, on which he has been transacting one of the largest, if not the largest, cattle business in the world. His cattle dealings during the late war were immense. His wealth is believed to have been very great, the insurance carried on his life being 75,000.

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SOME BOOKS ON ARCTIC TRAVEL are answerable for the wide spread notion that ice is pure and fresh when formed on water no matter how impure or salt. It may be the fact that the ice itself is chemically pure, but if that ice holds in suspension filth or salt which will combine again with the water on the melting of the ice, then the notion that such ice is pure is for all practical purposes a delusion and a sham, rather than propagate which stories, it were better, even if on that account alone, that such books had not been written. An epidemic of fever and diarrhœa at one of the hotels at Rye Beach this summer has been clearly traced to the ice. This had been procured from a pond of which the outlet had in recent years been closed by sand and stones washed up from the sea; the pond thus becoming a standing receptacle of mud and sawdust, there being two saw-mills on the stream above. The ice was subjected to chemical analysis, and was found to contain putrescent vegetable matter. The hotel stopped using this contaminated ice, and there was an end to the sickness among its boarders. In these days when so many farmers (may there be more of them is our wish) put up ice for home or dairy use, it will be well for them to bear this fact in mind If the water of a pond is unfit to drink, the ice made from that water is unfit to use for cooling purposes except when the ice is outside the vessel containing the articles that are desired to be cooled. City people will also do well to ascertain something about the source from which their ice man draws his supplies. We believe it to be scandalously filthy in some instances.

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A WORD ABOUT THE SURROUNDINGS of the farmer's home. We now and then see the barnyard or the pig-pen contiguous to the house. This is heathenish. God made cows and pigs, but he gave them a habitation distinct from man. Dutch stables are said to join the kitchen, but they are only used in winter, and in summer are scoured and white washed as though they were a part of the house. American civilization demands that there be a free and wide circulation of air between cows and men. As for pigs, whoever keeps them under his bedroom window ought to be indicted for keeping a nuisance. They are not so dirty an animal as some would like to make them, but there is little that is congenial between hog and man. The pig-sty is always a deformity to a place whenever the stench can penetrate the house.

## Thelemark Cattle.

The English *Agricultural Gazette* gives portraits of two individuals of a small but excellent milking breed of Norway cattle, with explanatory foot notes, which we give below:

"The Thelemark race is one of the few constant races of cattle, perhaps the only one, which Norway possesses. It is a well-defined mountain race, which, as its name denotes, has its home in Thelemark, and is found purest in the upper districts, Siljord, Hvidesend, &c.

"The animal is small. Full grown cows rarely attain a greater weight than 660 lbs. to 770 lbs.; but it must be remarked that they increase considerably in size when put on better food than usual, particularly if this takes place at an early age.

"The Thelemark breed is peculiarly a milking breed. On the royal farm at Ladegaardsøen the best milking cows have been of this race for the last three years, although animals of various breeds have been kept, and some rather large ones of 1,000 lbs. living weight and upwards. The stock has, therefore, in the course of the last few years been changed almost exclusively to Thelemark cattle. Thus the cow, 'Risoie' milked in 1868, 646¾ gallons, in 1869, 720 gallons, 1870, 689¼ gallons, or on an average of three years 685½ gallons, with a living weight of about 790 lbs. English weight, that is nearly 9 lbs. of milk for each 1 lb. living weight annually, a result which bears comparison with the best foreign milking breeds. Usually the Thelemark cows do not milk highly immediately after calving, seldom more than 3½ gallons daily, but they maintain the yield evenly, and do not remain long dry. It is also not usual that newly purchased animals give so rich a yield at first as afterwards; but yet we have instances of cows which have given above 3,000 pots (637 gallons) in the first year. However, such instances do not justify the notion that so high a yield is according to rule among newly-purchased Thelemark cows; it is naturally only in the case of exceptionally fine animals. Usually we must be well satisfied when a cow weighing 660 lbs. to 770 lbs. gives 425 gallons to 530 gallons of milk on regular good food.

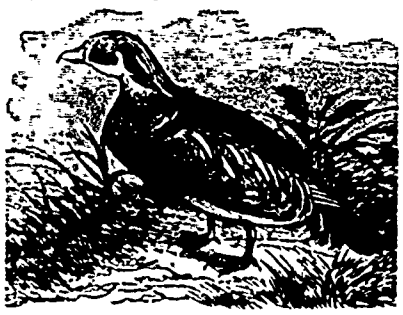
## Insect-Eating Birds.

With a praiseworthy endeavor to disseminate information, and at the same time advance their views in respect of the proper treatment of the inferior animals, the Massa-

Hawk-Owl.
*Surnia ulula. (Raptores)*

chusetts Society for the Prevention of Cruelty to Animals recently offered a prize for the best essay upon the Insect Eating Birds The prize was won by Mr Frank H Palmer As the preservation of insect eating birds, who are in truth the "farmers' best friends," is a subject of which the importance is only beginning to be rightly appreciated, we append some extracts from Mr. Palmer's essay with the accompanying illustrations:—

The practical utility of our native birds as agents for the destruction of noxious insects can hardly be over estimated. By studying the habits of birds and insects, we may easily discover the important part which each plays in the economy of nature; and history itself proves that any material interference with their relations to each other is sure to be followed by disastrous results. Hence the subject becomes of deepest importance, not alone to the agriculturist, but to every one who has either a business or patriotic interest in our country. Nature, if left to herself, establishes a wholesome balance amongst her creatures; that is, she produces no more of one species than shall be kept in check by another. If there is an insect which feeds upon a certain plant, there is also a bird which destroys the insect, and an animal which devours the bird; and so on up the scale, each curbing the undue increase of the next inferior creature. It is when man interferes with the working of this law that results are sure to follow disastrous alike to his own food, health, and happiness, and that of the creatures around him. It is because he has destroyed their natural enemies that insects have become a pest, and they will cease to trouble him only in proportion as he shall restore the balance of which nature shows the necessity It is not that insects are to be destroyed or condemned as a class. Nothing is created except for the fulfilment of some good end, and the value of insects is not inferior to that of any other class of animal life: none are without their legitimate uses; and it is only when they are stimulated to excessive increase that they become troublesome. Before passing judgment upon them, we must remember that insects fabricate the beautiful coral which is so useful and valuable to man. Of similar origin, too, is silk, which, in its manufacture, furnishes profitable employment to multitudes of men,



Wood or Summer Duck.
*Aix sponsa.*

women, and children, and brings in large revenues to the country. Insects we must thank for honey,—the sweetest of sweets. The air we breathe and the water we drink are kept pure and wholesome by the agency of myriads of little creatures which draw sustenance from the impurities of the elements. It is not, then, that insects are to be exterminated, even if it were possible, but only kept in check.

### Relative Fertility of Birds and Insects.

The majority of our native birds have but one brood of young in the course of the year: a few have two or three. In the case of the smaller insect-eating birds, the number of eggs to a brood is, on an average, not more than five. Some of the larger birds, as the various Gallinæ, lay from five or six to twenty eggs to a brood. On the other hand, the reproductive energy of insects is truly marvellous. It is said that a single pair of grain-weevils have produced six thousand young between April and August. The common varieties of aphides or plant-lice, which are found on almost all kinds of plants, are produced in spring from eggs laid the season before; and through the summer only females are developed. At the last of the season, males and females both appear: and eggs are laid for the brood which hatches early in the spring. Réaumur says that one individual in one season may become the progenitor of six thousand millions. The silk-worm moth produces about five hundred eggs; the great goat-moth about one thousand; the tiger-moth one thousand six hundred; the female wasp at least thirty thousand. There is a species of white ants, one of which deposits not less than sixty

Upper fig. Wood-Pewee. *Contopus virens.* Lower fig. King-bird. *T. carolinensis. (Insessores.)*

eggs a minute, giving three thousand six hundred in an hour. How, then, shall this enormous mass of insects be kept in check? What shall prevent them from overrunning the country, destroying the crops, and devastating the land?

### Food for Birds.

Various causes operate to check the undue increase of insects; and the chief of these is the appetite and instinct which a wise Providence has given to birds. If the number of eggs produced by insects is wonderful, the number destroyed by a single bird is no less so. Audubon says a woodcock will eat its own weight of insects in a single night. Dr. Bradley says that a pair of sparrows will destroy three thousand three hundred and sixty caterpillars in a week. We saw the parent bird visit a young purple martin on a church-spire opposite our window five times in as many minutes, each time with an insect. A brood of partridges will nearly exterminate the denizens of an ant-hill in a couple of days. Woodpeckers are constantly employed in ridding the orchards of insects and their eggs, which they skilfully discover under the pieces of dead bark. Robins, through the spring and summer, are continually hunting for worms and grubs which they find concealed under the surface of the ground. We recently noticed a common chipping-sparrow capture a moth; and, upon de-

Titmice.

priving her of it, we found it to be that of the common apple-tree caterpillar *(Clisiocampa Americana)*, so destructive to the orchards of New England. To check the excessive increase of insects is evidently the great task which birds are intended to perform. Did they have no other office save to cheer and encourage humanity with their beautiful plumage and song, and to typify a purer and more ethereal existence to us creatures who "grovel here below," even then they would deserve the favor of every Christian and every poet; but when the useful is combined with the beautiful, and a practical value is added to an elevating symbol, they command the interest of every one, and their protection becomes a matter of consequence to all.

### Decrease in Number of Birds.

It is a mournful fact of history, that during the past few years there has been a steady decrease in the number of our native birds in all parts of the country where man has formed his settlements. To account for this fact is easy. Man enters the forests which for hundreds of years have been the undisturbed nursery of birds. He cuts down the trees in which for centuries they have reared their young. He brings with him his gun; and, as long as there are any grouse or other game-birds in the neighborhood, the sharp report and murderous fire are his daily greeting to the wild creatures of the wood He dams the streams, and turns them aside, and uses their power to destroy the forests on their banks. His snares are set in the valleys, and his traps on the hill top His children search the woods for birds'-eggs and bring them home to be admired a moment as playthings, without a thought of the happy homes they have destroyed for the sake of a moment's pleasure. In short, man has soon taught the creatures, who scarcely feared him at first, that he is a monster to be dreaded, who will give them no rest nor peace. Thus it happens, that, as the centuries roll on, one species after another grows more and more scarce, or becomes altogether extinct; and, in their loss, the world loses more at the death of the last representative of a long line of imperial princes. Let us notice from history a few instances of the gradual decrease of some of our birds, that any who are doubting may be

Hooded Merganser.
*Lophodites cucullatus.*

convinced. Hear what Audubon testifies: "When I first removed to Kentucky, the pinnated grouse were so plenty that they were held in no higher estimation as food than the most common flesh; and no hunter of Kentucky deigned to shoot them. In those days, during the winter

the grouse would enter the farm-yard, and feed with the poultry, alight on the houses, or walk in the very streets of the villages. I recollect having caught some in a stable at Henderson where they had followed some wild turkeys. In the course of the same winter, a friend of mine who was

fond of practising rifle-shooting, killed upwards of forty in one morning, but picked up none of them, so satiated with grouse was he as well as every member of his family. My own servants preferred the fattest flitch of bacon to their flesh, and not unfrequently laid them aside as unfit for food." Twenty-five years after, the same author says, "Such an account may appear strange; but in that same country where, twenty-five years ago, they could not have been sold for more than one cent a-piece, scarcely one is now to be found. The grouse have abandoned the State of Kentucky, and removed (like the Indian) every season farther to the west-ward to escape from the murderous white man." The bird above mentioned was once probably very abundant in all the southern New England States, but is now only found in small numbers on Martha's Vineyard and one or two other islands off the southern coast of Massachusetts, being entirely extinct on the main land of New England.

Mr. J. A. Allen says,* "The mammalian and bird faunæ of all the older settled parts of the United States are vastly different from what they were two hundred years ago. These changes consist mainly in the great decrease in number of all the larger species, not a few of which are already extirpated where they were formerly common. A few of the smaller species of both classes have doubtless increased in numbers. Many of our water-fowl that are now only transient visitors,—as the Canadian goose, the several species of merganser, teals, black duck, and mallard,—undoubtedly once bred in this State (Massachusetts), as did also the wild turkey and prairie hen." An old farmer of Essex County recently told us that fifteen years ago the passenger-pigeon was accustomed to breed in considerable numbers in a forest not far from his house. Now a few pairs may be seen in the spring and fall migrations; but none in the summer. In the same county, ten

Upper fig. Yellow Warbler. Lower fig. Black and Yellow Warbler.

years ago, the ruffed grouse was quite abundant; but now it is rare that any are seen except in the deepest woods, and then only an occasional pair, most of them having been snared, and sent to the Boston market, laws to the contrary notwithstanding. Formerly some six or seven species of sea-ducks bred among the islands of Massachusetts; now none are to be found except the dusky-duck, and that in no great abundance.

*(To be continued.)*

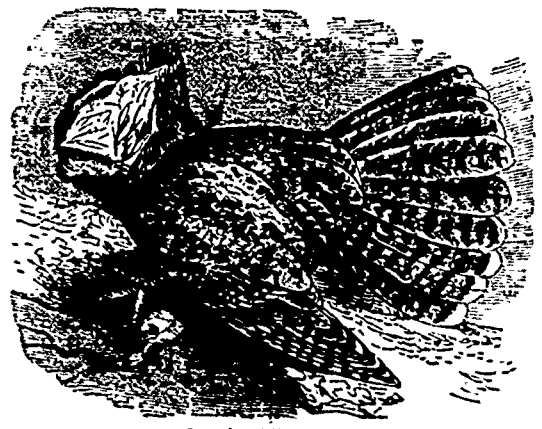
* "American Naturalist," Vol. III., No. 10.

## Flour.

Mr. Ephraim Cutter, M. D., contributes to the *New England Farmer* the following valuable article:—Flour, a contraction of *flower*, indicating the fairest, freshest, choicest part of anything, is the term generally understood to mean the finer part of ground wheat separated by bolting, and as mechanical fineness of substance has come to mean intrinsic fineness of quality, leaving out of sight entirely all chemical differences in favor of the one physical difference of diminished size of the ultimate particle, flour is popularly thought to be the best part of wheat, or indeed, better than wheat itself.

Food supports life by being received within and assimilated by the animal organism. Physiologists asserted, more than twenty years ago, that no substance affords nutriment, even though it contain all the organic elements unless it has all the natural peculiarities of organic composition, and contains incorporated with these elements some of those derived incidentally from the mineral kingdom, such as sulphur, iron, lime, magnesia, phosphorus and others. Food being the source whence the constituent elements of the body are derived, it must contain every element there met with, or fail to satisfy the requirements of existence.

The elements that enter into the composition of the human body are various. Carbon, hydrogen, oxygen, and



Cuckoo-Willis Widow.

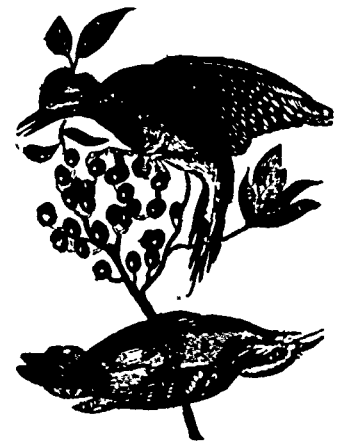
nitrogen are present in far larger quantities than any of the others, namely: sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, iron, fluorine, silicon, manganese, aluminum and copper; a list deserving of remembrance, and arranged in order of prevalence and importance, the first named elements being essential to the human system, while the latter are of less value.

The elementary substances in the human body are not all found in flour. Flour contains 86.7 per cent. of carbon, hydrogen and oxygen compounds, but differs from wheat in the amount of its nitrogenous compounds. Sulphur is not found in flour, and phosphorus but sparingly. In a thousand barrels of wheat, eight and two-tenths barrels would be phosphoric acid; in flour but two and one-tenth barrels. Thus, a person eating flour is eating food impoverished nearly seventy-five per cent. of phosphoric acid, his nerve producing, sustaining and corroborating element.

Chlorine is not found in flour, and soda little, if any—a large withdrawal of that indispensable element, common salt. Potassium is hardly present, but wheat contains several per cent. of this element. Wheat contains more lime and magnesia than flour, and some silica, flour none. Iron, fluorine, manganese, alumini and copper are found neither in wheat or flour.

Flour as food, therefore, contains the carbo-hydrates in excess, and is so generally relied on as the staple diet of civilized mankind, that it is a duty to analyze its title to preëminence as an aliment at the present day, and whether the universal and exclusive use of the article may not result in calamity to the human race.

Flour is mostly starch, containing but three elements—carbon, hydrogen and oxygen—the human body containing at least twelve elements beside those of starch. Dogs fed exclusively on flour have died in forty days; other dogs fed on wheat thrived. A ship's crew on a long voyage, obliged to live on flour exclusively for some time, suffered disastrous consequences. Indians fed on flour and sugar —which is much the same as starch—rapidly



Woodpeckers.

deteriorate. Hens fed on starch fail to have good eggs. Hogs fed on flour mill sweepings give unmerchantable pork. Flour affects the structures and tissues of the flesh.

The use of flour promotes fatty degeneration. The eating of more starch than is necessary must give fat in excess. Bright's disease of the kidneys, atheroma, rupture of cerebral arteries, causing cerebral hemorrhage, apoplexy and paralysis, cardiac disease from fatty degeneration, palpitation, feeble heart, rupture, probably cataract, glaucoma, arcus senilis, and others whose essential pathological condition is that of fatty degeneration, often come home to us with fearful suddenness. The essence of this fatty degeneration is seen in the breaking up, inflation and substitution of the normal tissues by the undue deposition of fat. The muscular fibres of the arterial coats are replaced by fat globules, crystals of cholesterine, and minute granules of fat, which are all readily seen under a good microscope. These morphological changes weaken the strength of the tissues, so that they are liable to rupture, allowing the blood to escape into the surrounding tissues, and by the pressure of the clot of blood cause results, the essence of several diseases, according to the site of effusion and amount of pressure.

When the fibres of the crystalline lens undergo fatty degeneration, the fibres become well defined in outline, dark and dotted over, inside and out, with minute granules or molecules of fat, and the effect is to alter the diaphanousness of the lens, render it opaque, and so obstruct the passage of light that the patient is deprived of the power of sight.

When the kidneys are affected with fatty degeneration, the epithelial cells in the urine are found dotted with fat molecules. Casts of the tubuli, waxy and fatty, are also found. The albumen of the blood escapes in large quantities into the urine, weakening the patient by the abstraction of an important element of strength. The kidneys themselves are sometimes softened, broken up and dissipated in a wonderful degree.

Fatty degeneration of the heart, surely detected only after death, where the muscular fibrillæ are examined under the microscope, is generally characterized by disturbances of the heart functions, the heart sometimes

Yellow-rumped Warbler.
*Dendroica coronata.*

rupturing from the inward pressure of the blood, caused by its own contractions.

Other organs and vessels of the human body are subject to this disease of fatty degeneration, but enough has been

said to indicate the effects of this kind of tissue displacement and disintegration

For some time physiologists refused to believe in the production of fat from starch, but it was decisively proved by fat found in the larvæ of the gadfly, born and fed in the cavity of the gallnut, where the only food was starch

The ultimate chemical composition of starch and fat is nearly allied, and both are easily interchangeable in the animal economy Fat can be produced from starch and sugar in the human body. Beeswax is a true fat formed from honey. Animals fed abundantly on gram, and suffering from deficiency of oxygen, become rapidly loaded with fat. Geese, prevented from moving and crammed with maize or wheat, have enlarged livers so charged with fat as to become unfit for proper functions. Stalled cattle are much fatter than those that travel far in search of food, and wild animals are lean. Starch in the human body is changed into sugar, becomes soluble and is absorbed into the portal circulation, enters the liver, and thence, by fermentation or otherwise, is changed to fat. The hydrogen gas given off is oxydized into water in the body. Fatty acids being derived from sugar by fermentation, and sugar being formed from starch in digestion, a diet containing starch in excess, with a minimum of mineral ingredients, will tend to produce diseases depending on the tissues being surrounded, infiltrated and replaced by fat and fat-acids, particularly when the eater leads an easy and sedentary life

Flour causes decayed teeth The prevalence of decayed teeth among flour-eating people is humiliating to modern civilization. It exists to an alarming extent among children, hardly one of whom, over five years of age, when subjected to examination is found with perfectly healthy teeth Savage races are noted for the perfection of their teeth Dentists seemed to hold that destruction of enamel involved the loss of the tooth. Physiologists attributed the preservation of negroes' teeth to their abstinence from hot drinks The Kaffirs hack their teeth with knives or rough iron, and the sharpening, instead of producing caries, acts as a preservative by facilitating the lamary process The East African will devour his again when the temperature would scald the hand. Both races have pearly teeth, except where lime and tobacco is chewed Among the North American Indians a decayed tooth is rarely seen. Their diet is chiefly animal food Civilized races, with all the advantages of a regular supply of food, comfortable abodes, and the stimulus of high mental culture, are less favored than the savages in this important respect Their staple food lacks the mineral elements needful to make teeth. Flour has little lime and phosphorus. Curtail anything three-fourths and you have the ratio of withdrawal in the above instances. Teeth are known to improve on proper diet

Flour may be a cause of the present general prevalence of premature grey hair and baldness, owing to the want of sulphur, an essential ingredient of hair, and natural baldness being uncommon among savages and non flour eating people The bristles from pigs fed on flour products are valueless to brush makers. Cattle, in the season of shedding their hair, require more salt than ordinary, and those fed on sufficient salt have hair become hair and glossy skin, showing the evident influence of a mineral ingredient In flour there is a large withdrawal of the basic element of salt, and hair fed on food so deficient in formative force and mineral ingredients as flour, must suffer serious loss of vitality

Flour may be a cause of the prevalence of weak eyes What may promote decay or weakness of the teeth, may do the same for the eyes A saturated solution of sugar in water injected under the skin of a frog or guinea pig will soon produce cataract in both eyes. Cataract is a degeneration of the fibres of the crystalline lens My own researches show that it is sometimes fatty Sugar is not so innocent a substance as ordinarily imagined. Starch becomes sugar before it gets into the circulation, and must strongly influence the physical condition of the ocular tissues.

## The Formation of Fog.

Dew is a condensation of invisible moisture from the air, which becomes visible when condensed, and its condensation is owing to a difference of temperature between the air which parts with the moisture and the object on which the moisture, as dew, is deposited. On the other hand, a mist or fog is simply a cloud floating lower than usual; in other words, it is a body of vapor rendered visible by contact with an atmosphere colder than that by which it was raised from the earth or the sea in the form of invisible vapor. The fine invisible particles of water suspended in the air are rendered visible when the temperature of the air is suddenly lowered, the direct effect of cold being to cause condensation and aggregation of the particles—in other words, the vapor is thrown into a gross form by cold, and in a certain sense is preparing itself to fall in the form of rain, and fall it must when the condensation reaches a certain point, and the air can no longer sustain the globules as part of itself. It can be understood, of course, how a mist be a rain and yet no rain be felt. It may be often observed that the spiders' webs and other such light bodies are loaded with moisture after a mist has prevailed for some time, but that moisture is not dew, it is, in the strictest sense of the word, rain, but falling so slightly that it cannot be felt, nor the act of falling seen. At times, however, it happens that the moisture can be felt, not as condensing in the form of dew, but falling in the form of the finest rain, so fine that at first we hesitate to call it rain, but perhaps increasing so as at last to bear not only the name but the appearance of rain, the result of the cloud or fog becoming so far condensed as to be unable any longer to float in the atmosphere.

It will be observed that the moisture held in solution by the atmosphere is invisible so long as the solution is perfect, and then we have a clear blue sky with sunshine or moonshine, as the case may be, and usually a considerable deposition of dew. But a lowering of the temperature of the air diminishes its power of holding water in solution, and the excess over and above its now limited capacity is rendered visible in the shape of mist or fog or cloud. The important point for the observer, therefore, is to note that dew is condensed on an object exposed to the atmosphere in connection with radiation of heat by that object, while fog is the result of condensation within the body or bulk of the air itself. The influence of heat is the key to every phase of these several phenomena. In hot weather the air is loaded with a larger proportion of moisture than in cold weather, and in hot countries the amount of atmospheric humidity is usually greater than in cold countries. The higher the temperature of the air, the greater is its capacity to carry moisture in perfect solution and invisible—unless, indeed, we regard the lovely azure color of the cloudless sky as the natural color of the moisture suspended in it; for there cannot be a question that if the atmosphere were absolutely dry, the sky would be black as ink, and diffused daylight a boon unknown. There are times when the moisture held in solution by the air not only deepens the blue of the sky, but, as may happen soon after sunrise, when as yet the sun has lifted but little vapor, and that is rendered invisible by complete absorption or solution, the diaphanous condition of the atmosphere is so perfect that distant objects are defined with unwonted clearness and the landscape presents an exalted tone, its beauty being strangely enhanced, and many objects acquiring a tone of unreality.

That mists and fogs should be more prevalent in marshes and along the courses of rivers than in upland districts will be understood from the explanations thus far offered. But as changes of temperature tend to precipitation of moisture, the mist of the mountain admits of the same explanation as the mist of the valley, although the minor circumstances of its production may be different. So again that very curious phenomenon, a London fog, however it may present problems that demand all the powers of the chemist and mathematician, and, indeed, of the astronomer and geologist, for a complete explanation, cannot, in a collective sense, be regarded as a mystery at all. Here is a great city warmed by fires and holding in its mass much stored up heat imparted to it by the summer sunshine. From this aggregation of edifices and animal life a warm mist is ever rising, and in fair weather with high barometer and with breeze enough to prevent stagnation, the vapors, the smokes, and other exhalations are quickly absorbed or dissolved into the general body of the air, and rendered invisible; so that, as seen from Cheapside, the summer sky is scarcely less blue than as seen from a green hill-side miles away in the heart of the country. But an immense city like London taxes the absorbing power of the atmosphere to the very utmost, and the slightest change of wind or temperature, or density unfavorable to the absorbing or dissolving process is followed by the formation of visible vapor, and then, as seen from Cheapside, the blue sky becomes a grey sky, and then a brown sky, and ultimately there ceases to be a sky, and the diffused daylight diminishes. If a very cold wave passes over, and with such slowness that the state of the air is that known as dead calm, the rising vapors are condensed so rapidly and are kept so closely over the place of their origin as to constitute a London fog, which is the worst of all fogs the world produces, being so largely contaminated with particles of carbon, the smoke being mingled with it, and treated by the cold stratum of air above in the same way as it treats the rising particles of pure water It must be remembered, too, that smoke is not dry carbon, but real vapor, the proportion of water in smoke being very large; and therefore the smoke is not to be regarded as an element superadded, for it is a part of the general humidity which the cold condenses, and not only renders visible to the eyes as an "atmosphere of pea-soup," but manifest to all the senses, so that we both smell and taste a London fog, provided it does not utterly choke us.

That fogs should prevail especially in November is no more a mystery than the conditions that produce them The first frosty weather finds the earth warm and exhaling moisture freely. Hence the first cold wave encounters a large bulk of warm vapor, and, having a large body of material to act upon, produces a more striking effect. But as the winter progresses the earth cools down, and the temperature of the surface approximates to that of the air, and while the exhalations are thereby diminished, the difference of temperature between the exhalations and the upper stratum of the air is less, and the mists produced are less dense, though more widely diffused. When the sun is seen like a red bullet grimly gleaming through the fog, it is a sign that at an altitude of a mile or less there is a clear blue sky and brilliant sunshine, which may be enjoyed in the course of a few minutes by the simple process of making an ascent in a balloon.

## Charbon or Anthrax Fever.

Great alarm has been caused in Ireland by the appearance among stock of a malignant disease which has been called Charbon. The veterinary correspondent of the Chicago *Tribune* says that the disease is either Anthrax Fever or Anthrax Carbuncle, and belongs to, or is one of the forms of, the large and exceedingly dangerous group or family of diseases known as Anthrax-diseases, the same of which Black Leg, Milk Sickness, and so called Hog Cholera are the frequent and well known representatives in the Mississippi Valley The disease called Charbon has been well known, though by various names, as an Anthrax form, not only in modern times, but also by the ancients, and has made its destructive appearance repeatedly in all ages, and in almost every part of the globe, in the tropics, in the temperate zone, and even in the frigid region,—sometimes as an epizootic, sweeping a whole country or a district; sometimes as an enzootic, attacking almost any animal, or a whole class of animals, in a certain locality; and very often as a sporadic disease, picking its victims here and there. Hence the disease cannot lay claim to the predicate "singular," as that would indicate that the same is new, peculiar, strange, or comparatively unknown, which is by no means the case. Probably the oldest record of the occurrence of Anthrax-disease, and very likely of the same form which is called Charbon, is given in the books of Moses (Exodus and Leviticus); and shows that not only the destructive character, but also the contagiousness, of that disease must have been known when the Israelites left Egypt. Homer, too, must have known Anthrax (Iliad, I., 50-52). So Ovidius (Metamorphos., VII., 536-585) describes an Anthrax-plague which prevailed as early as about a century after the Trojan War Other proofs that Anthrax-diseases were well known and made their frequent appearance in ancient times, are furnished by Plutarch, Dionysius, Livy, Lucretius, Thucydides, Virgil, Columella, and others Dionysius especially (Antiq Rom., lib VII, page 472) describes the disease as attacking first the pasturing live-stock, then the animals kept in the stables, afterwards the herders and the farmers, and finally other people. He gives also an account of the immediate causes, which are exactly the same that produce Anthrax diseases at the present time.

That later writers have left us abundant information in regard to Anthrax epizootics and enzootics, does probably not need any further proof: and that modern veterinarians and pathologists have not failed in paying sufficient attention to such a destructive and fatal group of diseases,—Prof. C. F Heusinger published in 1850 a monograph on Anthrax diseases of Animals and men, which contains over 800 pages. is also evident enough, and will probably be taken for granted without giving a long list of names and dates.

It cannot be said that either Charbon or any other form of Anthrax baffles the skill of the veterinary surgeons. Of course a disease in which the morbid process commences with a wholesale destruction of tissue, and which causes death not seldom within a few minutes, is fully developed, *eo ipso* incurable; just the same as it is impossible to restore a rotten apple or a foul egg to soundness again. Concerning such a disease, it is, therefore, much less the task of veterinary science to find a remedy or a cure than it is to investigate the nature of the morbid process, and to discover the causes which are able to produce the same; for, that accomplished, an effective prevention, of much more value than all efforts to effect a cure, is in most cases not so very difficult. If physiological laws are not violated, Anthrax, and other similar diseases of man and beast, are an impossibility. Regular and uniform feeding of nothing but what is sound and healthy, fresh and pure water of medium temperature for drinking, pure air for breathing, protection against the extremes of the weather, and avoiding any exposure to the contagion, will surely prevent any Anthrax disease, no matter whatever its name may be, whether it is Charbon, Black-Leg, Wild-Fire, Gangrenous Erysipelas, Hog-Cholera, Milk Sickness, or Malignant or Gangrenous Typhus.

The fact that physiological laws have been better complied with in modern times than in the dark middle ages or in ancient times, and that live-stock, as a general rule, is kept in a more rational way now than in olden times, has accomplished this much: that all forms of Anthrax have lost a great deal of their old violence. The contagion, too, if otherwise reliable authors can be trusted, has lost considerable of its former intensity.

## Dying in Harness.

Only a fallen horse, stretched out there on the road,
Stretched in the broken shafts, and crushed by the heavy load,
Only a fallen horse and a circle of wondering eyes,
Watching the frightened teamster goading the beast to rise.

Hold! for his toil is over—no more labor for him;
See the poor neck outstretched and the patient eyes grow dim;
See on the friendly stones, how peacefully rests his head—
Thanking, if dumb beasts think, how good it is to be dead,
After the burdened journey, how restful it is to lie
With the broken shafts and the cruel load—waiting only to die!

Watchers, he died in harness—died in the shafts and straps—
Fell, and the great load killed him; one of the day's mishaps—
One of the passing wonders marking the city road—
A toiler dying in harness, headless of call or goad.

Passers, crowding the pathway, staying your steps awhile,
What is this symbol? "Only death! why should we cease to smile
At death for a beast of burden?" On through the busy street,
That is ever and ever echoing the tread of the hurrying feet!

What is the sign? A symbol to touch the tireless will.
Does he who taught in parables, speak in parables still?
The seed on the rock is wasted—on headless hearts of men,
That gather and sow, and grasp and lose—labor and sleep—and then—
Then for the prize! A crowd, in the streets of ever echoing tread—
The toiler crushed by the heavy load, is there in his harness—dead!

## Every Boy his Own Shoemender.

I have a word to say to farmers' boys which may or may not be of any benefit to them. I wish to show you in this article how you may pass some of your long winter evenings in a manner which may afford you some pleasure and may be of some little profit. My idea is that you learn to repair your own boots and shoes Perhaps to many this idea would not be agreeable. Well, all I have to say to such is read this article through and then judge. If one-half of my boy readers think favourable of it, my object is accomplished. These are hard times. Money is scarce and hard to get, and as boys wear out their boots and shoes very fast, it is quite an item in the expense of the family. In many instances you are obliged to carry your boots five or six miles to a shoemaker, and it often happens that he cannot do them at once, so you are obliged to go again. Besides you have to call on father for money, and as money is hard with him you don't like to do it. Now then, if you think you would like to learn to do such a job yourself, so as to be a little more independent of both father and shoemaker, I will offer some helpful suggestions.

Of course you have no tools and will have to buy; but you will only want a few to start with. I will give you a list of about what you will need: A shoe hammer, a half dozen awls of various sizes, with an awl-handle, a few pegs of different sizes and lengths, a pair of No. 3 shoe pinchers, a small bottle of edge blacking, a cake of heel ball, a pair of lasts to fit your boots, and two shoe-knives, one for trimming and one with a longer blade, called a "skiver" for beveling the soles. No doubt you will find an old pair of shoe lasts at almost any shoe-shop that will fit your boots which you can purchase cheap. It is a better way to buy old ones, as your feet are growing. You will need a strap to hold the boot on your knee, a hook to pull the last out, and a peg-cutter. The strap you will find at the barn, and perhaps the last two things you will find about the house. Now, when you grind your trimming-knife, the blade of which should not be over three inches long, do not grind it down to the handle, but only 1½ inches from the point. The trimming-knife is an important thing. Your sisters must not take it to pare apples, nor must you use it to cut off pegs. It must be kept for trimming alone. You will find that much depends on the condition your knife is in. If it is dull it will make your work look rough, and is apt-to glance out and go through the upper leather.

But let us go to work and fix your boots. You will not need a shoe-bench; spread the tools on the table before the kitchen fire. If the boots are hard and dry, soak them a while in water and the tap will peg on much easier. Now, then, lay each boot upon the leather and mark around and cut it so that the tap will be quite large. Then put the leather into water and soak it well. You will find it a good plan, as you take the leather from the water, to work it in your hands and hammer it gently on a flat stone or iron; it makes the leather more firm. Now look at the bottom of your boot. If one side is worn more than the other, you must peg on a piece, trim it even with the sole, and then take your long knife and bevel the inside edge and the ends so as to make the surface of the sole even. Bevel the heel of the tap on the inside of the leather and make it fast to the boot by three or four pegs up and down the middle. Now comes the sharp trimming-knife to fit the tap to your boot. Strap the edge often, so as to keep it keen, and work carefully.

After you have it fitted, you are ready to peg it on. Your shoe-pegs must all be kept separate in little cloth bags or boxes, and you will judge which kind is needed by measuring at the edge of the sole. You must select the awl by the size of the peg you wish to drive. And you need not feel discouraged if you find it awkward work. To drive a shoe-peg smooth requires some little practice, but you will get it after a while. It is a good plan to mark around the edge of the tap, say one-eighth of an inch from the edge, and then peg on the line, keeping the broad side of the awl toward you. After you have drawn the line around, first tack it about with pegs on the line, so as to keep the tap in its place. If the awl sticks, punch it into a cake of beeswax. You must slant your awl well inward or the pegs will drive out so as to show. After you have done, take your pocket-knife and trim off the pegs you have broken down so as to make your work look smooth. The edge will need more trimming, and if you don't get it smooth, take a bit of glass and scrape it. Shoemakers have tools for all these things, but you must learn to get along without. Now put on the edge blacking, and after it has dried rub on the heel ball and rub lightly with a woollen cloth, and you have a good polished edge.

But the heels need fixing; no doubt they are run over at the side. And let me say to you here that if you can invent some simple thing that will prevent boot and shoe heels from "running over," the great mass of the people will shower thanks on your head. The shoemakers use what they call "steel slugs." They are very hard and brittle. Care will be needed in driving them. You will do well to make the holes with a very large awl.

Well, let us say you have finished your job. It don't look very well, but remember it is your first effort; you have made some mistakes, but will do better next time, and when you go to the shoe shop you will learn many little things and go home and put them into practice. If you like such things it is far better to do it yourself than to go a distance to a shoemaker and perhaps be obliged to go after them two or three times before they are done. It would be well for you to try an old pair first that you will need next summer. I have said nothing about sewing, for it requires much more practice.

You need have no fears of injuring your shoemaker; he had rather make new work than to repair old. But when you need a new pair give him the job, for while he is working his family are consuming your wheat, corn, beef, pork, wood, &c. Now what say you, boys, will you try? If you have a mind to, cut this article out.—*Uncle Joe, in N. Y. Tribune.*

## A New Industry in California.

A San Francisco correspondent of the Baltimore *Sun* says—A new industry unknown to the press is in process of inauguration in California, which may interest the rural districts of Maryland and elsewhere. It is making sugar, table syrup and table oil from watermelons. Mr. Roe, of San Francisco, seeing that our beet sugaries have not made profit, turned attention to watermelons. He found that when beet sugar proved unprofitable in Hungary, Herr Hoffman substituted melons, with most gratifying success. His sugary at Zombar is one of the largest and best paying in Europe. Accordingly Dr. Hiller was sent to Hungary to consult with Herr Hoffman, compare climates, and if satisfied, he was instructed to buy works and import skilled labor. To make double assurance he bought a large sugar factory in full and successful operation, and engaged its best men to come to California and go on just where they left off. In this way, supposing the melons to be all right, there can be no failure. The machinery has arrived at New York, and workmen are now planting the home-made engine and boilers. The locality is on Andros Island, in the long Delta 'twixt the rivers Sacramento and San Joaquin—pronounced Sanwaukin. This belongs to a group of low islands that are submerged at high water, and therefore not fit for culture. But when reclaimed by embankments they are exceptionally productive in all seasons, wet or dry. But while beets are not always sure, melons are a crop that never fails in this climate, and the factory being on navigable waters, it can get melon juice from a vast area of melon country at small expense for transport. Andros Island itself is famous for melons, and so are Grand and Brannon Islands near by, and now reclaimed. The distance from San Francisco is about 70 miles by water. Watermelons with white pulp are preferred. Their agriculture is more than 60 per cent. less costly than beets. They are planted twelve feet apart one way, and the other way six feet apart. Before weeds interfere the leaves of the plants cover the ground and kill them. Besides, they make an impenetrable mulching, which keeps the soil moist and prevents baking. Harvesting melons is cheap and cleanly, while uprooting beets is laborious, and the coarse, adhering dirt is removed by hand while the crown is cut away as unprofitable for sugar. Beets also need much weeding.

A melon field needs only one-fourth the ploughing. Beets can only be delivered in the root, because the juice turns quickly black and the sugar becomes starch, while melon juice is not affected for several days. Beets are washed and rasped or sliced, while melons, by one cut, deliver their juice over a seed strainer into the vats direct. The melon being free from impurities, which make costly chemistry in beet sugar is much less expensive.

Beet syrup is only fit for distillation. The syrup from melons is delicious. The seeds make the finest table oil, and the refuse is good for cattle. Taking account of so many advantages, sugar from melons, though rated at 7 per cent. of the weight of the fruit, instead of 8 allowed for beets, costs less to make. The difference may be set down as 5½ cents for melon sugar to 7 cents a pound for beet sugar. In regard to quality beet sugar is superior. Unless extra care be used beet sugar is apt to have an unpleasant buggy flavor.

Let it be understood that beets can only succeed in most bottom lands. Melons strike deep root and they grow everywhere on our uplands. No doubt they would thrive luxuriantly in Jersey, Delaware and Maryland. In the sandy soil states South no crop can be more certain, and Baltimore would make a convenient centre for supplies of melon sugar works. San Francisco sympathises with Baltimore and means to trade with her. Cheerfully we offer our experiences in everything we think will help her prosperity, and we mean to keep her advised of our success in melon sugar-making, believing it will serve her interest.

## Spare and Protect the Toads.

Many boys seem to have a wonderful itching to knock over every toad with a stone or club, and when they happen to go within a few rods of a bird, they look around almost instinctively for a stone to kill the dear little songster. This is exceedingly wrong, as toads and birds are the farmer's best and most useful friends and helpers. It is said that there is actually a considerable commerce in toads between France and England. A toad of good size and in fair condition will fetch a shilling (twenty-five cents) in the London market, and a dozen of the extra quality are worth £1 sterling ($5). A writer in a European paper states that one may see these imported toads in all the market gardens where the soil is moist, and the owners of these gardens even prepare shelter for them. Many grave persons have shaken their heads when they heard of this new whim of the English, but those laugh the best who laugh the last. This time the English are in the right. The toad is very helpful to the husbandman as a destroyer of injurious insects on which it chiefly feeds. Toads have a curious, net-like lasso, which they throw out so quickly and trap insects, that a fly is not sufficiently agile to escape. Boys, spare the harmless and useful toads, and the dear little birds that subsist on insects which destroy our fruit and grain. The President of the Farmers' Club of the American Institute, N. C. Ely, who owns a farm worth $60,000, in Connecticut, once stated to the Club, that he was accustomed to pay fifty cents each for toads which were put on his farm to destroy insects. We place small pieces of boards over little depressions in the garden and about the yard, as refuges for useful toads.—*Practical Farmer.*

## A Remedy for Drought.

The torrid temperature of late has told severely upon pastures and mowing fields. The communication from a correspondent in Bucks county, in your issue of the 12th July, reports suffering, and it may not be amiss to notice the relative value of "Sub-Turf Ploughing." Sir Edmund Stracey, of Lincolnshire, I believe, made use on his permanent grass land of a "sub turf" plough, so as to loosen the turf about ten and a-half inches below the surface without turning over the flag. This stirs the soil underneath, admits air and rain, and permits the root of the herbage to spread in search of food. No marks are left indicating that the land has been so ploughed, except from the straight lines of the coulter at the distance of about fourteen inches from one another. In about three months from the operation said lines are totally obliterated, and the quantity of aftermath not only, but the thickness of the bottom, have been admired by all his neighbours.

Another advantage consists in the improved drainage. Water previously lying stagnant in many parts after heavy rains, and to a considerable depth in the lower grounds, no longer stays—none is seen lying on any part, the whole being absorbed by the earth.

There are many fields in grass that, owing to lack of means or of outlets, cannot be tile-drained, but which might be materially improved by this sub-turf stirring. As I have not seen the subject reviewed in any agricultural paper for many years, will the *Germantown Telegraph*, in these Centennial days, critically examine the merits of this practice, and oblige a sincere friend of farming—*Cor. Germantown Telegraph.*

## American Cheese in England.

The London *Farmer* predicts a rather gloomy future look-out for English cheese-makers, pointing out their inability to compete with American manufactuers. It says: At the present time the cheese-trade is very much depressed, and there is every symptom that it will for some time continue so. As contrasted with milk, cheese is not a perishable article, and it can be conveyed long distances over sea without injury of any kind. Indeed, it is by some stated that the voyage improves the flavor of cheese. In some cases this is no doubt true, while in others the opposite holds good. But in any case it is a simple matter to bring enormous quantities of cheese from foreign countries, especially from America, where the finest grades of cheese are at the present

time bought at 8 cents to 9¼ cents per lb., say 33s. to 39s. per cwt. These prices, to the English farmer whose speciality is cheese, would be simply ruinous. But how long can they be staved off? It is certainly strange that English cheese should be worth £20 per ton more than American in our markets, when the latter is quite equal in all respects to the former; but it is futile to expect this disparity to continue when we know it is but the result of fancy or prejudice, than which nothing is more fickle and uncertain. It follows, then, that as we cannot obtain fresh milk from other countries, while cheese can come to us from the Antipodes, if need by, our dairy farmers will turn their attention more and more to the milk trade with the cities. And it is fortunate there is this alternative, and that the demand for milk goes on, and will go on, rapidly increasing. In course of time, not very far hence, we believe there will be very little cheese made in England, except in districts through which no railway passes. And yet it would at present appear that cheese must be made in summer time in other districts than these, when the flow of milk is greater than the demand for it. The various cheese factories which are situated within three or four miles of a railroad, are very conveniently lending themselves to meet the exigencies of the milk trade. In the hot months when milk is plentiful, and when there is a great risk in sending it to distant towns, they work up all their milk into cheese, while later on they act as convenient receiving houses from which the milk is sent off to the various great centres of population. This system answers admirably in so far as it provides a means by which an overflow of milk may be made into cheese—the next best use to devote it to. It has for several years been a fact, but now is a more patent one, that milk-selling has paid the farmer much handsomer returns than cheese-making has. We may compute this difference in favor of milk-selling at about one-fourth of the total sum realized. But, then, the dealer requires of the farmer that he supply him with a given quantity in winter, otherwise the summer's milk cannot be accepted, but for the winter's supply correspondingly higher price is easily obtained.

## Nutritive Properties of Fruits.

That fruits, as a rule, have but small nutritive value has long been known. Every school-boy finds out for himself *how soon hunger returns after a most liberal indulgence* in his neighbor's orchard. Recently, the well known chemist, Dr. Fresenius, has carried out a series of analyses with a view of determining the proportion of anhydrous albumen contained in various common fruits. In the following list he gives the number of parts of the different fruits he analysed that are required to supply one part of albumen in the form of nutriment for the body:—Cherries, 117; English rennet apples, 192; currants, 222; grapes, 120; blackberries, 196; gooseberries, 227; apricots, 120, queen mother plums, 200; strawberries, 161; common plums, 210; pears, 385; raspberries, 183; peaches, 210, and white dessert apples, 254. Hence it follows that very nearly 4 lbs. of pears would be required to yield as much albumen as is contained in an egg of 50 grammes weight, the per-centage of dry albumen in the *egg* being but 14 or 15 per cent. According to Professor Voit, of Munich, a man in ordinary work requires every twenty-four hours for his nutrition as much albumen as is contained in eighteen eggs, *i.e.*, 118 grammes; so that if it were required to give him the necessary amount in the form of peats, no less than 72 lb. *per diem* must be eaten. Notwithstanding these startling disclosures, the value of fruit as an article of diet, is not to be despised. Not only is it most easily digestible in itself, but by reason of the acid which all its varieties contain (though oftentimes so disguised by sugary matter as to be imperceptible to the taste), it aids in the digestion of other substances which are less amenable to the action of an ordinary stomach. But those persons who intend becoming vegeterians—especially if they have a failing for pears, and expect to grow fat on them—should be sure that their stomach capacity is sufficiently large before they entirely forswear the use of fish, flesh and fowl.

## Coming Agricultural Shows.

| *Name.* | *Place where held.* | *Date.* |
|---|---|---|
| Aldborough | Rodney | Oct. 10 |
| Alliston | | Sept. 26-27 |
| Amaranth | Whittington | Sept. 26 |
| Ancaster T'p | Ancaster | Sept. 29 |
| Arran | Tara | Oct. 4 |
| Ashfield and Wawanosh | Dungannon | Sept. 26 |
| Aurora | | Oct. 10-11 |
| Beverly | | Oct. 11 |
| Biddulph | Granton | Sept. 19 |
| Blenheim | Drumbo | Sept. 29 |
| Bothwell | Bothwell | Oct. 3-4 |
| Brock Township | Sunderland | Oct. 2-3 |
| Burford | Harley | Oct. 10 |
| Caledon | Charleston | Oct. 12-13 |
| Castor | Abingdon | Oct. 14 |
| Carrick | Mildmay | Oct. 6 |
| Cayuga | Cayuga | Oct. 6 |
| Central | Guelph | Oct. 3-4 days |
| Central | Port Hope | Sept. 26-3 days. |
| Clifford Union | Clifford | Sept. 29 |
| C. Wellington | Fergus | Oct. 12-13 |
| Derby | Hillsth | Oct. 5 |
| Dufferin | Orangeville | Sept. 28-29-30 |
| East Elgin | St. Thomas | Oct. 11 |
| Egremont | Yeovil | Oct. 10 |
| E. Hastings | Roslin | Oct. 18 |
| E. Huron | Brussels | Oct. 10-11 |
| E. Kent | Thamesville | Sept. 29-30 |
| Elma | Newry | Oct. 4 |
| Emma & Wallace | | Sept. 26-27 |
| Emmosa | Rockwood | Sept. 28 |
| Erin T'p | Erin Village | Oct. 17 |
| Esquesing | | Oct. 10 |
| E. Tilbury | | Oct. 6 |
| Etobicoke | Islington | Oct. 10 |
| Euphemia | Florence | Oct. 6 |
| E. York | Markham | Oct. 5-6 |
| Finch | Berwick | Oct. 4 |
| Haldimand | Grafton | Oct. 12 |
| Halton | Milton | Oct. 12-13 |
| Hay Branch | Zurich | Oct. 3-4 |
| Hibbert | Staffa | Oct. 3 |
| Holland | Arnott | Sept 28 |
| Howard | Ridgetown | Oct. 4 |
| Howick | Gorrie | Oct. 3 |
| Hullett | Clinton | Oct. 3-4 |
| Humberstone | Humberstone | Oct. 4 |
| Lennox | Napanee | Oct. 3-4 |
| Lindsay | | Oct. 5-6 |
| Listowel | Listowel | Sept 26-27 |
| Lucknow | Lucknow | Oct. 10 |
| Luther | Luther Village | Oct. 12 |
| Malahide | Aylmer | Oct. 4-5 |
| Mara | | Oct. 3 |
| Matilda | Dixon's Corners | Sept. 21-22 |
| Midland Central | Kingston | Sept. 27-3 days. |
| Milverton | | Oct 2 |
| Mitchell | | Sept 21-22 |
| Mornington | Milverton | Oct. 2 |
| Morris Branch | Blythe | Oct. 12-13 |
| Nassagaweya | Nassagaweya | Sept. 29 |
| Newcastle | | Oct. 3-4 |
| N. Brant | Paris | Oct. 5-6 |
| N. Brock | Cannington | Oct. 4-5 |
| N. Bruce | Paisley | Oct. 3 |
| N. Grey | Owen Sound | Oct. 4 |
| Normanby | Ayton | Oct. 2 |
| Northern Central Union | Orangeville | Sept 28-3 days. |
| N. Ontario | Port Perry | Sept. 27-28 |
| N. Oxford | Woodstock | Oct. 2-3 |
| N. Perth Cheese Show | Stratford | Oct. 5-6 |
| N. Victoria | Glenarm | Oct. 3 |
| N. Waterloo | Berlin | Oct. 10-11 |
| N. York | Newmarket | Oct. 3-4 |
| Ont. Dairy Association | Ingersoll | Sept 14-3 days |
| Osnabruck | Osnabruck Centre | Sept. 20 |
| Ottawa | Ottawa | Sept. 26-3 days. |
| Owen Sound Horticultural | | Sept. 26-27 |
| Perth | Stratford | Oct. 5-6 |
| Peterborough, Victoria, Northumberland and Durham | Port Hope | Sept. 26-3 days. |
| Pickering | Brougham | Oct. 11-12 |
| Prince Edward | Picton | Oct. 10 |
| Proton | Hopeville | Oct. 11 |
| Provincial | Hamilton | Sept. 18-5 days |
| Pushnch | Aberfoyle | Oct. 12 |
| Quebec | Montreal | Sept. 12-4 days. |
| Raleigh | Raleigh | Oct. 2 |
| Rosemont | Rosemont | Oct 12 |
| S Bruce | Walkerton | Oct. 10-11 |
| S. Dorchester | Lyons | Oct. 3 |
| S. Essex | Amherstburg | Oct. 4-5 |
| S. Grey | Durham | Oct. 3-4 |
| S Huron | Exeter | Oct 5-6 |
| Sidney | Frankford | Oct. 4 |
| S. Norwich | Otterville | Oct. 13 14 |
| S. Ontario | Whitby | Sept 14-15 |
| Sophiasburgh | Demorestville | Oct 11 |
| Southwold and Dunwich | Iona | Oct. 3 |
| S. Oxford | Ingersoll | Sept. 14-15 |
| S. Perth | St. Mary's | Oct. 3 |
| Stanley | Rayfield | Oct 12 |
| St. Vincent | Meaford | Oct. 5 |
| S Victoria | Lindsay | Oct. 5-6 |
| S. Waterloo | Ayr | Sept. 27-28 |
| Sydenham | Annan | Sept. 26 |
| Tavistock | | Sept. 15 |
| Toronto Gore | Clareville | Oct. 10 |
| Trafalgar | Oakville | Oct. 6-7 |
| Tuckersmith | Seaforth | Oct. 9-10 |
| Tudor | Millbridge | Oct. 13 |
| Turnberry | Wingham | Sept. 29 |
| Walpole | Walpole | Oct. 11 |
| W Bruce | Kincardine | Oct 4-5 |
| W. Elgin | Wallacetown | Oct. 5 |
| Western Fair | London | Sept. 26-4 days |
| W. Flamboro | Waterdown | Oct. 10 |
| W. Garafraxa | Douglas | Oct 11 |
| W. Hastings | Belleville | Sept. 14-15 |
| W Huron | Smith's Hill | Sept. 27-28 |
| W. Kent | Chatham | Oct. 3-4 |
| Williamsburgh | Bouck's Hill | Sept. 25 |
| Wilmot | N. Hamburgh | Sept. 28 |
| Winchester | W. Winchester | Sept. 20 |
| W. Northumberland and Tp. of Hamilton | Colbourg | Oct. 24-25 |
| Wroxeter | Wroxeter | Oct 4 |
| W. Wellington | Harriston | Oct. 11-12 |
| W. Zorra | Youngsville | Oct. 4 |
| Yarmouth | Yarmouth Centre | Oct. 10 |

## Short-horn Sales.

### G. M. Bedford, Stoner Herd, Ky.

| | | |
|---|---|---|
| Lady Bates 6th, A. L. Niccolls, Ottawa, Kansas | | $6000 |
| 20th Duchess of Goodness, | do. | 2100 |
| 47th Duchess of Goodness, | do. | 900 |
| 25th Duchess of Goodness, | do. | 1825 |
| 8th Duchess Louan, | do. | 1000 |
| 2nd Duchess Louan, | do. | 725 |
| 10th Duchess Louan, A. L. Niccolls | | 500 |
| 6th Duchess Louan, | do. | 570 |
| 11th Duchess Louan, J. Scott, Paris | | 625 |
| 9th Duchess Louan, Thos. Goff, Paris | | 500 |
| Airdrie Belle, J. W. Embry, Richmond | | 2750 |
| Airdrie Belle 3d, A. W Embry | | 4050 |
| Oneida Belle, | do. | 2000 |
| 36th Duchess of Goodness, A. L. Niccolls | | 1200 |
| 35th Duchess of Goodness, Avery & Murphy, Port Huron, Michigan | | 1000 |
| 45th Duchess of Goodness, N. Berry | | 550 |
| 31st Duchess of Goodness, A. L. Niccolls | | 500 |
| Duchess Wiley, Forrest Lotton, Paris | | 900 |
| Duchess Phyllis, Geo. Bean, Winchester | | 705 |
| 2d Duchess Phyllis, B. J. Tracey, Winchester | | 760 |
| 3d Duchess Phyllis, E. P. Gambell, Millersburg | | 605 |
| Belle Mapleton, N. Berry | | 815 |
| Nellie Bly, Abner Strawn, Ottawa, Ill. | | 380 |
| 14th Duke of Thorndale (23,459), Wm. C. VanMeter, Winchester | | 17,000 |
| Imperial Bates, A. L. Niccolls | | 3200 |
| 29th Duke of Goodness, David Selsor, London, Madison Co., O | | 1200 |
| Thornbell, Silas Corbin, Paris | | 450 |
| 27th Duke of Goodness, Jno. Roseberry, Paris | | 325 |

#### Summary.

| | | | |
|---|---|---|---|
| 48 females, average | $ 784.10 | Total | $37,640 |
| 21 bulls, do | 1200.20 | do | 25,205 |
| 69 head, average | $910.80 | Total | $62,845 |

Average on bulls without 14th Duke of Thorndale, $365.25.

The *Ohio Farmer* makes the following comments:

"It was announced in the catalogue and advertisements that the entire herd was to be sold, and considerable dissatisfaction was expressed among the large number of breeders present from a distance, when Mr. Bedford stopped the sale with thirty head of the Goodnesses not sold; he said the prices were not satisfactory and he could not afford to sell them. * * * It was announced Saturday morning that the 14th Duke of Thorndale was bid off by Mr. W. C. Van Meter for Mr. Levi Goff of Paris, Ky., who is a son-in-law of Mr. Geo. M. Bedford, the former owner. We were also authentically informed that the 16 head of valuable animals that were struck off in the name of A. L. Niccolls, of Ottawa, Kansas, at an aggregate of about $20,000, at the Bedford sale, were all taken back by Mr. Bedford the next morning, which will leave at least 45 head of the Stoner Herd unsold."

### Clay & Son, Hall & Taylor, and B. F. Bedford, Paris, Ky.

| | |
|---|---|
| Sarah Rice 7th, Ansel Shropshire, Leesburg | $ 510 |
| Valley Princess 9th, J. L. Patterson, Broadwell | 525 |
| Valley Princess 10th, H. C. Hutchcraft, Paris | 800 |
| Oxford Countess 4th, Jas. Bigstoff, Mt. Sterling | 725 |
| White Lady, B. F. Vanmeter, Winchester | 800 |
| Nora 2d, J. J. Adair, Shawhan Station | 650 |
| Bloom 5th, Caleb Kearns, Paris | 1630 |
| Valley Princess 13th, H. C. Hutchcraft | 720 |
| Cambridge Rose 5th, H. C. Smith, Stoney Point | 2750 |
| 4th Louan of Chesterfield, H. C. Buckner, Paris | 500 |
| Clara, H. C Buckner | 660 |
| Lady Goodness 13th, Bow Park Co., Canada | 410 |
| Goodness, of Sweet Valley, & c. c., Bow Park Co | 500 |
| Valley Rose, Bow Park Co | 530 |
| Valley Rose 3d, Bow Park Co | 520 |
| 24 Maid of Sweet Valley, Abner Strawn, Ottawa, Ill. | 510 |
| 2d Duchess of the Valley, Geo Bean, Winchester | 600 |
| Roan Duchess 12th, Bow Park Co | 1425 |
| Florida 2d, H. C Hutchcraft | 1070 |
| Valley Princess 11th, *Corbin & Patterson, Paris* | 1100 |
| Vally Princess 8th, do do | 1200 |
| Lord of the Manor, Donly & Calmers, Winchester | 700 |
| Victor, Caleb Kearns | 460 |
| Gloster's Oxford, Dill Wiggin, So Bloomfield, O | 150 |
| Daisy Duke, *A Shropshire* | 210 |
| Prince Andrie 2d, W. W. Goddard, Harrodsburg | 450 |

#### Summary of Hall & Taylor's Stock.

| | | | |
|---|---|---|---|
| 12 females, average | $127 50 | Total | $513 |
| 7 bulls, do | 206 43 | do | 144 |
| 19 head, average | $246.05 | Total | $6575 |

#### B. J. Clay & Son's Stock.

| | | | |
|---|---|---|---|
| 27 females, average | $379 82 | Total | $10,255 |
| 8 bulls, do. | 132.00 | do. | 1,055 |
| 35 head, average | $323.14 | Total | $11,310 |

#### B. F. Redford's Stock.

| | | | |
|---|---|---|---|
| 19 females, average | $710 05 | Total | $13,320 |
| 8 bulls, do. | 153.12 | do. | 1,225 |
| 27 head, average | $538.70 | Total | $14,545 |

#### Combined Summary of Day's Sale.

| | | | |
|---|---|---|---|
| 58 females, average | $194 91 | Total | $23,705 |
| 23 bulls, do. | 161.96 | do. | 3,725 |
| 81 head, average | $400 37 | Total | $32,430 |

### Warfield, Combs & Burgess, near Lexington, Ky.

| | |
|---|---|
| Imp. Lady Bickerstaff, Abner Strawn, Ottawa, Ill. | $ 575 |
| Louan of Elkhill, J. C. Smith, Newtown | 510 |
| Moss Rose 2d, Bow Park Co | 1400 |
| London Duchess 6th, Walter Scott, Lexington | 705 |
| 4th Mazurka of Chesterfield, Ware & McGoodwin, Danville | 1740 |
| Julietta of Hilburn, A. J. Alexander, Spring Station | 605 |
| Geneva Gem, Abner Strawn | 705 |
| Duett 5th, E. P. Gamble, Millersburg | 610 |
| Dulcet, W. C. Van Meter, Winchester | 575 |
| Rose of Sharon of Waverly, W. H. Fisher | 1005 |
| Eva Taylor E. C. Thomson, Edinburg, Ind | 710 |
| May Queen, W. H. Fisher | 525 |
| Vesta 3d, F. J. Barbee, Paris | 500 |

#### Summary of Mr. Warfield's Stock.

| | | | |
|---|---|---|---|
| 14 females, average | $239.93 | Total | $3390 |
| 3 bulls, do. | 93.33 | do. | 280 |
| 17 head, average | $215.88 | Total | $3670 |

#### Mr. Burgess' Stock.

| | | | |
|---|---|---|---|
| 24 females, average | $346.67 | Total | $8320 |
| 1 bull, do. | 105.00 | do. | 105 |
| 25 head, average | $337.00 | Total | $8425 |

#### Mr. Combs' Stock.

| | | | |
|---|---|---|---|
| 18 females, average | $325.78 | Total | $6350 |
| 4 bulls, do. | 66 25 | do. | 265 |
| 22 head, average | $300.68 | Total | $6615 |

The *Country Gentleman* notices a peculiarity in this sale worthy of mention. The seventy head were sold to fifty-five different purchasers, fifty one of whom only got one animal each. We doubt if there ever was a sale that compared with this one in this respect.

**Combined Summary of the Four Sales of the Kentucky Series**

| | | | | |
|---|---|---|---|---|
| 2?4 females, average | $507.60 | Total | | $123,720 |
| 68 bulls, do. | 471.52 | do. | | 35,340 |
| 297 head, average | $501.88 | Total | | $149 060 |

Average of bulls, omitting 11th Duke of Thorndale, $242 23.

**Grimes, Anderson, Jones, Steel and Beatty, Chillicothe, O.**

| | |
|---|---|
| Lisie, J. S. Kirk, Washington C. H. | $1000 |
| Oxford Gwynne 2d, Jno. Montgomery, Granville | 1000 |
| Rose of Cashmere, Jno. Montgomery | 1000 |
| Oxford Gwynne 6th, do | 1000 |
| Princess Gwynne 9th, do | 500 |
| Mary Sharon 2d, A. L. Hyde, Clarksburg, Ky | 850 |
| Mazurka's Rose of Sharon, Jno Montgomery | 600 |
| 1st Count of Oneida, H. W Brown, Harrisonville | 500 |

**Summary of Mr. Grimes' Stock.**

| | | | | |
|---|---|---|---|---|
| 42 females, average | $382.02 | Total | | $16,005 |
| 12 bulls, do. | 144.42 | do. | | 1,715 |
| 54 head, average | $328.71 | Total | | $17 750 |

**Mr. Anderson's Stock.**

| | | | | |
|---|---|---|---|---|
| 13 females, average | $226.15 | Total | | $2919 |
| 1 bull, do. | 110.00 | do. | | 110 |
| 14 head, average | $217 86 | Total | | $3050 |

**Mr Jones' Stock**

| | | | | |
|---|---|---|---|---|
| 13 females, average | $186.15 | Total | | $2420 |
| 1 bull, do. | 170.00 | do. | | 170 |
| 14 head, average | $185 00 | Total. | | $2590 |

**Mr. Steel's Stock.**

| | | | | |
|---|---|---|---|---|
| 7 females, average | $143.57 | Total | | $1005 |
| 1 bull, do. | 50 00 | do | | 50 |
| 8 head, average | $131 87 | Total | | $1055 |

**Mr. Beatty's Stock.**

| | | | | |
|---|---|---|---|---|
| 5 females, average | $25.00 | Total | | $ 125 |
| 3 bulls, do. | 45.00 | do. | | 135 |
| 8 head, average | $70 00 | Total | | $ 560 |

**Combined Summary of Day's Sales**

| | | | | |
|---|---|---|---|---|
| 80 females, average | $241 91 | Total | | $19,795 |
| 18 bulls, do | 122 78 | do. | | 2,210 |
| 98 head, average | $255.15 | do. | | $25,005 |

## The Fairview Herd, T. L. Megibben, Offutt & Hearne.

| | |
|---|---|
| Lily of the Valley, F. J. Barbee, Paris, Ky | $1000 |
| Red Daisy of Fairview 10th, Downer & Cattle, Marshalltown, Iowa | 700 |
| 23rd Duchess of Goodness, W. H. Murphy, Newtown, Ky | 1000 |
| Red Daisy of Fairview 4th, L. P Gamble, Millersburg, Ky | 1275 |
| Red Daisy of Fairview 3d, Jos Scott | 725 |
| 8th Duchess of Springwood, Hon W. E Simms, Paris, Ky | 1000 |
| Imp Wallflower Queen, W. T. Hearne | 600 |
| Louan Duchess of Fairview, R. P. Scobee, Thomson's Station, Ky | 900 |
| Rosa Gwynne, Garrard & Bear, Paris, Ky | 500 |
| Annie Washington 3d, L P Gamble | 705 |
| Imp Wild Eyes of Horton Park, Canada West Stock Association, Toronto | 1700 |
| Imp. Azalia, Canada West Stock Association | 1000 |
| Mazurka Belle 2nd, J C Smith, Newtown, Ky | 750 |
| Mazurka of Elmwood, A. J Alexander, Spring Station, Ky | 975 |
| Rosamond Duchess 3rd, Canada West Stock Association | 800 |
| 3rd Proud Duke, Guthrie, Hall & Thomas, Shelbyville, Ky | 440 |
| Earl of Cambridge 3d, W S. Nicolls, Bloomington, Ill | 365 |
| Proud Duke 2nd, W. H Murphy | 1950 |
| Earl of Cambridge, J R. Shelley | 800 |
| T J Megibben's 43 females aggregated | $18,075 |
| Average | 432 |
| 18 bulls aggregate | 3,375 |
| Average | 187½ |
| W. N Offutt's 8 females aggregate | 6,440 |
| Average | 792½ |
| One bull | 1,950 |
| W T Hearne's 5 females aggregate | 985 |
| Average | 197 |
| One bull | 110 |

## Coming Short-Horn Sales.

Sept. 6.—Carmichael & Jackson, Tama City, Ioa.

Oct 11.—H. P. Thomson, Thomson's Station, Ky.

Oct 12.—Messrs. Bush & Hampton, Winchester, Ky.

Oct. 13.—John V. Grigsby, Crethmore Herd, Winchester, Ky.

Oct. 14. - John W. Bean and Robinson Brothers, Winchester, Ky.

Oct. 17.—W. H. Fisher.

Oct. 18.—Thos. Corwin & Son, Boyd's Station, Ky.

Oct. 18 -H. Clay Hutchcraft, Paris, Ky.; Shorthorns.

Oct. 19.—Ayres & McClintock, Millersburg, Ky.; Shorthorns.

Oct. 20. - Crouch & Bro., Plum Lick, Bourbon County, Ky.

Oct. 10.—Ware & McGoodwin, and E. L. Davidson, Lexington, Ky.

Oct. 16 - Jas. C. & Geo. Hamilton, Winchester, Ky.

Oct. 17.—Joseph Scott, Paris.

## STOCK NOTES.

Since the export of American stock to Japan commenced, a few years ago, it is computed that 2,000 head of Shorthorns have been sent from the former to the latter country.

Stock from Canada.—Cattle and horses still go over regularly in the Dominion steamers. The last batch of horses realised 75 to 100 guineas each, and the beasts were prime and ready for the butcher.

Mr. T. S. Cooper, of Pennsylvania, has purchased of Russell Swanwick of the Royal Agricultural College Farm, Cirencester, England, *his entire herd of Berkshires* (with the exception of three old sows). The poor health of Mr. Swanwick was the reason of the sale.

The Duke of Manchester has given 3000 guineas to Earl Bective for a promising bull calf, Third Duke of Underly, bred from one of his lordship's fine Duchess cows. Verily Lord Bective's 1873 importation of Duchesses from America has been to the noble lord a very profitable investment.

Ayrshires for Ontario, Canada.—We see that Professor Brown, of Ontario, Canada, has selected a very superior lot of Ayrshire cattle from the celebrated herd of the Duke of Buccleugh at Drumlanrig, Dumfriesshire, Scotland, for exportation to the Ontario Experimental Farm in connection with the recently established Government School of Agriculture there.

The British papers mentioned the purchasing by Professor Brown, for the Ontario School of Agriculture, of a very superior lot of Ayrshires from the Duke of Buccleuch's herd; of five gimmers from the famous Border Leicester flock of Mr. Ferguson of Cupar Angus; and of some splendid polled Angus cattle of Lillyfour blood, from Mr. Farquhason, of Alford.

There was shipped from Toronto on Aug. 8th. to Mr. L. Stewart, Camp Grove, Iowa, a car load of stock, among them being 4 Cotswold rams, 10 ewes and a Short-horn bull calf, Prince of Orange, purchased from Jas. Russell, Richmond Hill; 4 choice South-down rams from Robert Marsh, Richmond Hill; 22 Cotswold ewes and rams from other sellers, and 6 Cotswolds and 2 Berkshires from the Messrs. Snells Bros.

The *North British Agriculturist* says:—A few days ago a valuable consignment of Cotswold sheep left Cirencester station. Fifty ewes and one ram, purchased of Mr. R. Garne, of Aldsworth, were consigned to Mr. Parks, of Waukegan, Illinois; 72 shearling ewes and rams, from the flock of Mr. H. Cole, of Ashbrooke, were purchased by Mr. Beattie, of Toronto; and 26 shearling ewes and 1 ram, also bred by Mr. Cole, were consigned to Messrs. Miller, of Ontario.

Imported Cotswold Bucks.—Messrs. W. L. Waddy & Sons, Bagdad, Ky., offer fifteen imported Cotswold rams for sale at reasonable prices. These imported Cotswold sheep have just arrived at Bagdad, and some of them are just over from England, and some are Canadian bred. They are the highest priced lot, the Messrs. Waddy inform us, ever brought to Kentucky. The sheep are from the flocks of Wm. M. Miller, John Miller, and John Snells Sons, of Ontario, Canada.

The English *Live Stock Journal* says of the Fourth Duke of Clarence, the recent purchase of the Canada West Stock Association:—Mr. Lodge will have some difficulty in finding another Fourth Duke of Clarence. He is what we call a beauty of beauties. He was bred by Col. Gunter, of Weatherby Grange; his sire, 18th Duke of Oxford, was by the magnificent Grand Duke 10th, and from Holker's beautiful Grand Duchess of Oxford 5th. Can we wonder at the grandeur of this young Duke, when we observe that his sire and dam are bred by the two leading Bates breeders in England? His dam is Duchess 109, by 2nd Duke of Claro (21,576); granddam, Duchess 100, by 3rd Duke of Warfdale (21,619); Duchess 87, by 7th Duke of York, by Grand Duke of Oxford, by 4th Duke of Oxford, &c.

The Kentucky *Live Stock Record* says:—We are indebted to Mr. Jno. B. Kennedy, Paris, Ky., of the firm of Messrs. Kennedy, Bedford and Ferguson, of Bourbon County, Ky., for the following information obtained from Mr. Eastman, in reference to the shipment of beef to England. Mr. Eastman informs Mr. Kennedy that they have 16 steamships taking out beef, that they ship from three to four hundred head per week, and the cost of fitting up the vessels and slaughter house was $60,000. We have heretofore described the mode and manner of shipment. They obtain the following prices for the offal, blood 6c., hearts 10c., feet 40c., horns 14c., tails 10c., fat $5., hide $6., liver 30c., paunch 20c., heads 25c., entrails 18c., tenderloin 12c. The cost for killing is 90c. per head, and this company have shipped from July 11th to 23rd 785 head.

Bell's *Messenger* says:—We do not remember ever to have seen a public announcement of an important private sale last year. It was talked about in private circles, but we believe never found its way into "the papers." We allude to the transfer of Seventeenth Lady of Oxford from the Gaddesby herd to the possession of Mr. Holden, of Laurel Mount, Shipley, Yorkshire. The heifer, a daughter of Ninth Duke of Geneva and Thirteenth Lady of Oxford, was calved July 24th, 1875, and was sold when about 14 weeks old. We do not much care to announce the prices reported from private bargains, but having been authoritatively informed that Seventeenth Lady of Oxford brought her breeder 2000 gs., see no reason to withhold the information from our readers. From this, his spirited beginning, we shall expect to hear of Mr. Holden in future, in connection with Shorthorns.

The English *Live Stock Journal* says:—On Saturday last, the 29th ult., the *Idaho* arrived from New York, having on board another choice importation of Shorthorns for Mr. Fox, of Elmhurst Hall, Lichfield. Though only numbering three head, two are *the selection* of one of the finest herds in America, viz, that belonging to Mr. Ab. Renick, of Clark County, Kentucky, and of his famous Rose of Sharon tribe:—Rosebud 12th, a grand red heifer, of great substance, beautifully level, and square in her quarters, of unusual length, yet displaying no slackness of rib or loin, she cannot fail to develop into a massive fine cow. Her companion, Nora 8th, of rich red roan colour, greatly resembles her; if anything, superior in fore-end, and not her equal behind, having slightly drooping quarters, still a sweet, taking heifer, having her tubular symmetrical frame set off by a perfect type of head, and the best flat waxy horns we have yet seen on a Rose of Sharon. Both are forward in calf to Mr. Renick's magnificent old bull 4th Duke of Geneva. Red Rose 11th (whose name is quite a misnomer), of the young Mary family, is a splendid show cow, red in color, of deep girth and immense square frame; she is evenly, yet heavily covered all over with flesh of the best quality, being a grand handler. Her style and character are all that could be desired; in fact, the equal is seldom seen; she is also forward in calf. They arrived in excellent bloom and health, notwithstanding the great heat they had to endure whilst in Jersey City, where the thermometer stood at 103 degrees in the shade.

## Short-Horns for Canada.

The *Agricultural Gazette*, July 31, says:—On Thursday, July 27, Mr. W. Ashburner, of Netherhouse, Ulverston, the agent for the Bow Park Farming Co., Ontario, Canada West, despatched, per the Circassian, from the Mersey, the third consignment of pure-bred Bates Shorthorns, which Mr. Ashburner has for the last few months been purchasing for the Company in this country. Already there have gone out two females which cost 2,500 gs. and 2,000 gs. respectively; and in our last notice we intimated that Mr. Ashburner was still on the look-out for purchases of the best blood, and to mate with those gems of the softer sex he has, with that persistency for which the men of the northern counties are noticeable, managed to seduce from Mr. Lodge, of the Rookery, Yorkshire, the magnificent rich roan yearling bull, 4th Duke of Clarence, (33579). Mr. Lodge was very averse to sell, and at last, after naming a price (2,500 gs.) which he doubtless thought would drive off his "persecutor" in despair, and finding that that was useless, challenged the would-be purchaser to send him a substitute for his prized animal. Like the American estate agent, Mr. Ashburner was equal to the occasion and happened to know that Mr. Brogden, M.P., had Lightburne Duke of Oxford, a young bull of great promise, eminently suited for Mr. Lodge, but not for Bow Park, which would replace the 4th Duke at the Rookery, seeing that he is a son of the 5th Duke of Wetherby and Grand Duchess of Oxford 12th, by 2nd Duke of Wetherby. Thus it came to pass that the 4th Duke of Clarence was a passenger by the Circassian, with the honour of being the highest-priced male animal that has yet left us. He was bred by Colonel Gunter, of Wetherby Grange; his sire, 18th Duke of Oxford, by Grand Duke 10th, from Holker's Grand Duchess of Oxford 5th. His sire and dam thus form connecting links between the herds of two breeders, (the Duke of Devonshire and Col. Gunter). His dam is Duchess 109th, by 2nd Duke of Claro (21,576), grandam Duchess 100th, by 3rd Duke of Wharfedale (21,619); and so on through Duchess 87th, by 7th Duke of York, by Grand Duke of Oxford, by 4th Duke of Oxford, etc. Mr. Ashburner has also purchased from Mr. Lodge, to accompany him, Princess Oneida, and Princess Victoria Oneida, bred by Sir Clifford Constable, of the "Place" tribe.

The most valuable of the females now sent out is Wild Eyes 31st, purchased from Mr. Cheney, of Gaddesby; she is by 3rd Duke of Claro, from Wild Eyes 30th, a daughter of 7th Duke of York.

The remainder of the animals by the Circassian are as follows:—

From Berkeley Castle—Knightley Grand Duchess, by Grand Duke 4th, from Nymphalin, by Bull's Run; and her bull calf, by Grand Duke of Geneva. Lady Emily 5th, by 18th Duke of Oxford, of Sir Charles Knightley's "Walnut" family; and her bull calf, by Duke of Rosedale. Rose O'Lee, by Grand Duke of Geneva, from Rosy, by Grand Duke of Kent.

From Elmhurst Farm—Lady Fawsley 2nd, a very handsome cow; and her daughter, by her late owner's (Mr. Fox) much-sought-after 24th Duke of Airdrie.

From Mr. Slye, Beaumont Grange, Lancaster—America's Oxford, from America, of the "Acomb" tribe, by Marmaduke; and her red bull calf, by Grand Duke of Thorndale 2nd, by 9th Duke of Geneva, from Grand Duchess 20th, by 4th Duke of Thorndale. The sire of this calf left for Canada by the last shipment in the Polynesian. Lady Bates 5th, a daughter of Grand Duke of Thorndale, completes the shipment—in all, 14 animals.

# Miscellaneous.

AGRICULTURE, said Socrates, is an employment the most worthy the application of man; the most ancient and the most suitable to his nature. It is the common nurse of all persons in every age and condition of life; it is the source of health, strength, plenty, and richness; and of a thousand sober delights and honest pleasures. It is the mistress and school of sobriety, temperance, justice, religion, and, in short, of all virtues, civil and military.

NEW METHOD OF CLEANING WOOL.—*Les Mondes* describes M. Paulmes' new method of cleaning wool for which such important advantages are claimed. According to this, a current of air of thirty or forty degrees temperature is passed through the raw wool, followed by a current of hydrochloric acid gas, previously dried and cooled. In this way the wool is not affected, but any vegetable substances adhering to it are speedily and entirely decomposed. After this has been affected, a current of air is passed through to dispel the hydrochloric acid gas and the temperature is gradually raised to one hundred and thirty degrees, to complete the destruction of the various vegetable matters. This being done, a current of air charged with ammoniacal vapor is then passed through in order to get rid completely of any remaining traces of hydrochloric acid, and the operation is completed.

WHAT DO MOLES EAT? The *Rural New Yorker* does not care whether high or low "authorities" declare that ground moles eat *nothing* but "insects," but says that the assertion is simply false, and any man who possesses skill enough to catch a live mole can prove it to be so. Without, says our cotemporary, at this time going into any argument on this mooted question, we will simply state one fact easily determined by our highest authorities or anybody else, and that is, the ground mole will devour earth or angle worms when in confinement or at liberty, and these worms are *not insects*. Furthermore, this *worm, Lumbricus terrestris*, is the mole's principal animal food, if our own personal observation has not led us far astray. But leaving the food out of the question, a vigorous ground mole will lift up and kill a row of plants in far less time than a thousand of our most noxious insects, not excepting grasshoppers and potato beetles. It is to be feared that our "authorities" who talk so glibly about the "useful mole," know little of cultivating gardens infested with these pests. One season of gardening with a dozen moles ter acre would satisfy them to dispense with these secret subterraneous assistants.

UNAIRED ROOMS. I pass some hours in every town whose windows might as well be sealed with the walls for any purpose they have but to let in light. They are never opened summer or winter. In the winter it is cold; in the summer the flies get in, or, if they are netted, the dust sifts through the nets. Now, I can tell a person who inhabits such chambers when I see him in the street there is such a smell about his clothing I always wish for a sniff of Cologne, or harsthorn, or burnt leather, or something of the sort, to take the taste out. A house that is never aired has every nook and corner filled with stale odors of cooked meats, boiled vegetables, especially cabbage and onions, which, as the weeks go by, literally reek in their hiding places. The very garments of the children tell the same story of uncleanliness. It is bad to have unwashed clothes, but there may be an excuse for it. But what excuse can there be for unaired ones, when air is so cheap and free? There is death in such unaired chambers. Better a swarm of flies or a cloud of dust; better frost or snow in a room, than these intolerable smells. The first thing in the morning, when you are ready to go down stairs, throw open your windows, take apart the clothing of your beds, and let the air blow through it as hard as it will. There is health in such a policy.

HOME LIFE A HUNDRED YEARS AGO.—One hundred years ago not a pound of coal or a cubic foot of illuminating gas had been burned in the country. No iron stoves were used, and no contrivances for economizing heat were employed until Dr Franklin invented the iron framed fireplace which still bears his name. All the cooking and warming in town and country were done by the aid of fire kindled on the brick hearth or in the brick oven. Pine knots or tallow candles furnished the light for the long winter nights, and sanded floors supplied the place of rugs and carpets. The water used for household purposes was drawn from deep wells by the creaking "sweep." No form of pump was used in this country, so far as we can learn, until after the commencement of the present century. There were no friction matches in those early days, by the aid of which a fire could be easily kindled, and if the fire "went out" upon the hearth over night, and the tinder was damp so that the spark would not catch, the alternative remained of wading through the snow a mile or so, to borrow a brand of a neighbor. Only one room in any house was warm unless some of the family was ill; in all the rest the temperature was at zero during many nights in the winter. The men and women of a hundred years ago undressed and went to their beds in a temperature colder than that of our modern barns and woodsheds, and they never complained.

LANGUAGE OF ANIMALS.—The acuteness of the sheep's ear, it is said, surpasses all things in nature that I know of. The ewe will distinguish her own lamb's bleat among a thousand, all bleating at the same time, and making a noise a thousand times louder than the singing of psalms at a Cameronian sacrament in the fields, where thousands are congregated—and that is no joke either. Besides, the distinguishment of voice is perfectly reciprocal between the ewe and lamb, who, amid the deafening sound run to meet one another.

There are few things which have ever amused me more than a sheep-shearing, and then the sport continues the whole day. We put the flock into the fold, set out all the lambs to the hill, and then send the owes to them as they are shorn. The moment that a lamb hears its dam's voice it rushes from the crowd to meet her, but instead of finding the rough, well-clad, comfortable mamma which it left an hour or a few hours ago, it meets a poor, naked, shriveling—a most deplorable-looking creature. It wheels about, and uttering a loud, tremulous bleat of perfect despair, flies from the frightful vision. The mother's voice arrests his flight—it returns—flies and returns again, generally for ten or a dozen times before the reconciliation is perfect.

HOW TO MAKE A FISHING-ROD.—A straight slender switch makes a very good one, but a better one may be made thus: Take a piece of dry elastic wood, about seven feet long, and dress it until it is round and smooth, say three-quarters of a inch in diameter at the largest end and tapering to one-quarter at the top. With small brass wire make four or five rings of one-eighth of an inch opening, and leave the two ends of the wire long enough to fasten the rings closely to the rod, by wrapping the projecting ends with waxed thread. Put one ring at the top, and the last one about 16 inches from the lower end of the rod. If the rod is not made of dark-colored wood, it should be stained a dark color and varnished. Get a coil of small strong fishing line, from which cut your lines about 12 feet long. The hook should be about three eighths of an inch across the widest part, with a sharp slender point, standing well away from the stem. Fasten it neatly to the line, and about seven inches from the hook put a sinker. One gram of common shot will be enough unless the stream runs very swiftly. This is fastened by cutting it half through with a sharp knife, and closing it smoothly around the line. Pass the line through the rings on the rod, and on the end of the line fasten a button or piece of wood whittled to form a toggle that will not pass through the rings, and your tackle is completed.

NEED OF REGULARITY IN FEEDING.—Sheep, writes a stock breeder, are good time keepers. They know the very minute their food should be supplied and are disappointed if it does not come. The good sheep-feeder, therefore, should see that regularity and promptness prevail in the care and management of his stock. I know from experience that when one has a newspaper or book in his hand in which he is interested, and is in warm quarters by the fire-place, he is very apt to let a half-hour or an hour pass while his sheep are hungering for their food. Sheep should have daylight to eat by. I would feed hay but twice a day, feeding not earlier than eight in the morning, and at two o'clock in the afternoon the first half of the winter, and at seven and three o'clock the last half, giving grain about eleven o'clock. At each of these hours the sheep will be looking for their feed, and if for any cause it is delayed one or two hours, they will be watching and restless; and if for some cause it is given one or two hours sooner than usual, for several days afterward they will get ready for their feed at that early hour and wait impatiently until it is given them. One and the same person should do all the feeding, that an equal amount be given at each time. If we wish to secure the full benefit of their food, and the greatest profit of their keep, we must avoid exposure to the changes of the weather. This can be done with warm sheds well ventilated. Warmth is favorable to fattening—is equivalent to a certain amount of food. They must have also comfortable quarters and plenty of ease.

THE COMPOSITION OF GOOD MORTAR.—To obtain good mortar, as much depends on the character of the ingredients and the manner of mixing them as on the goodness of the lime itself; it does not necessarily follow that because a lime is good the quality of the mortar will be good also; the best lime ever burnt would be spoilt by the custom, common among builders, of mixing with it alluvial soil and rubbish taken from the foundation pits of intended buildings. The sand should be hard, sharp, gritty, and for engineering purposes, not too fine; it should be perfectly free from all organic matter, and with no particular smell; good sand for mortar may be rubbed between the hands without soiling them. The water should also be free from all organic matter, and on this account should never be taken from stagnant ponds. The presence of salt in sand and water is not found to impair the ultimate strength of most mortars, nevertheless it causes the work to nitrate, or, as it is commonly termed, saltpetre, which consists of white frothy blotches appearing on the face of the structure; it also renders the mortar liable to moisture and for these reasons should never be present in mortar intended for agricultural purposes, although for dock walls and sea works it may generally be used with advantage and economy. Sand is used to increase the resistance of mortar to crushing, to lessen the amount of shrinking, and to reduce the bulk of the more costly material, lime. Water is the agent by which a combination is effected, and as sand does not increase in volume by moisture, it necessarily follows that no more of the aqueous element should be employed than is absolutely necessary to fill the interstices between the sand, and render the whole into a paste convenient for use; and the greater the strictness with which this is adhered to, the more compact and durable will be the mortar.

AT NO PERIOD in life is watchful care over the functions of the brain more requisite than during the acquisition of knowledge by the youth.

Plodding, persevering study requires a store of vigorous nervous force, or the child *may sink under the mental toil.*

Stern necessity may compel the student to strain his powers beyond what is prudent, and early promise of excellence be blighted thereby.

To such we can recommend Fellows' Compound Syrup of Hypophosphites. It will not only restore the sinking patient, but its use will enable the toiling subject to preserve his mental and nervous standard without detriment.

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