Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- ☐ Coloured covers/ Couverture de couleur
- ☐ Covers damaged/ Couverture endommagée
- ☐ Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/ Le titre de couverture manque
- ☐ Coloured maps/ Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- ☐ Coloured pages/ Pages de couleur
- ☐ Pages damaged/ Pages endommagées
- ☐ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached/ Pages détachées
- ☑ Showthrough/ Transparence
- ☑ Quality of print varies/ Qualité inégale de l'impression
- ☑ Bound with other material/ Relié avec d'autres documents
- ☑ Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- ☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- ☑ Continuous pagination/ Pagination continue
- ☐ Includes index(es)/ Comprend un (des) index

Title on header taken from:/ Le titre de l'en-tête provient:

- ☐ Title page of issue/ Page de titre de la livraison
- ☐ Caption of issue/ Titre de départ de la livraison
- ☐ Masthead/ Générique (périodiques) de la livraison

☑ Additional comments:/ Commentaires supplémentaires: Wrinkled pages may film slightly out of focus.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
										✓	

THE CANADA FARMER

VOL. III. No. 12. | TORONTO, UPPER CANADA, JUNE 15, 1866. | POSTAGE FREE.

The Field.

Familiar Talks on Agricultural Principles.

DRAINING.

THIS important method of ameliorating the soil takes effect by carrying off superabundant moisture. A very simple illustration may be used to explain the philosophy of it. Plants which are kept in flower-pots would soon rot at the root, if the water with which they are supplied were left to stagnate in the bottom of the pot, without any means of escape. To prevent this, there is a hole at the bottom of the pot, through which the superfluous water trickles out. Drainage performs the same part for the field, which the hole does for the flower-pot. In consequence of this provision for getting rid of an excess of moisture, several advantageous results are secured. There is not only a wholesome and suitable bed for the roots of plants to spread and grow in, but the earth being rendered less moist at the surfae, evaporation is greatly diminished. As evaporation cools the surface greatly, it follows that draining enables a soil to retain heat much better. Hence crops on well drained land grow more quickly and ripen much earlier than those on undrained land. For the same reason, such a soil can be worked earlier in spring and later in autumn than one not drained. The extremes of excessive heat and drought are borne much better by drained than by undrained land. In a very wet season, the excessive rains quickly settle through the ground and are carried off, while in a dry time, the porous character of the soil allows the moisture held in store below the point of evaporation to rise to the surface, under the action of a natural law, called *Capillary Attraction*. Draining also opens the soil to a free access of air, and thus promotes the absorption of the nutritive substances there are in it, and which are made soluble by rain. It also prevents what is known as the "souring" of the soil. It tends to lessen the effect of frost in heaving out the roots of clover and grasses, or freezing them out in consequence of water standing on the surface of the ground. In short, as Prof. Dawson observes, "draining renders land easier and more pleasant to work, makes crops more sure and heavy, prevents alike injuries from drought and excessive moisture, economizes manures, and is equivalent to the deepening of the soil and lengthening of the summer."

Notwithstanding the valuable results of draining, which have been briefly stated, it is to be regretted that it is not as yet very extensively practiced in this country. Here and there, a farmer of advanced views has resorted to it, but the cases are few and exceptional. Its universal adoption would work little short of a revolution in Canadian agriculture. For the information of such as are disposed to try this important amendment, we extract the following short summary of the methods of underdraining, from "Norton's Elements of Scientific Agriculture."

"First, as to depth; where a fall can be obtained, this should be *from 30 to 36 inches*. The plants can then send their roots down, and find to this depth a soil free from hurtful substances. The roots of ordinary crops often go down three feet, when there is nothing unwholesome to prevent their descent. The farmer who has a soil available for his crops to such a depth, cannot exhaust it so soon as one where they have to depend on a few inches, or even a foot of surface. Manures, also, cannot easily sink down beyond the reach of plants. On such a soil, too, deep ploughing could be practiced, without fear of disturbing the top of the drains. The farmer should not, by making his drains shallow, deprive himself of the power to use the subsoil plough, or other improved implements that may be invented, for the purpose of deepening the soil. There are districts in England, where drains have had to be taken up and relaid deeper for this very reason. It would have been an actual saving to have laid them deep enough at the first.

"Second, as to the way in which they should be made, and the material to be used."

"The ditch should, of course, be wedge-shaped, for convenience of digging, and should be smooth on the bottom."

"Where stones are used, the proper width is about six inches at the bottom. Small stones should be selected, or large ones broken to about the size of a hen's egg, and the ditch filled in with these to the depth of nine or ten inches. The earth is apt to fall into the cavities among larger stones, and mice or rats make their burrows there; in either case, water finds it way from above, and washes in dirt and mud, soon causing the drain to choke. With small stones, choking from either of these causes cannot take place, if a good turf be laid, grass side down, above the stones, and the earth then trampled in hard. Cypress or cedar shavings are sometimes used, but are not quite so safe as a good sound turf. The water should find its way into the drain from the sides, and not from the top."

"Stones broken to the size above mentioned are expensive in this country, and in many places they cannot be procured; in England, it it now found that tiles, made of clay, and burned, are cheapest. These have been made of various shapes.

"The first used was the horse-shoe tile. This was so named from its shape; it had a sole made as a separate piece to place under it, and form a smooth surface for the water to run over.

"Within a few years this tile has been almost entirely superseded by the pipe tiles (which are merely earthenware pipes, of one inch bore or larger, and made in short lengths.) These tiles have a great advantage over the horse-shoe shape, in that they are smaller, and are all in one piece; this makes them cheaper in the first cost, and also more economical in the transportation.

"*All* these varieties are laid in the bottom of the ditch, it having been previously made quite smooth and straight. They are simply placed end to end, then wedged a little with small stones, if necessary, and the earth packed hard over them. Water will always find its way through the joints. Such pipes, laid at a depth of from 2½ to 3 feet, and at proper distances between the drains, will in time, dry the stiffest clays. Many farmers have thought that water would not find its way in, but experience will soon show them, that they *cannot keep it out*. The portion of earth next the drain first dries; as it shrinks on drying, little cracks begin to radiate in every direction, and to spread until at last they have penetrated through the whole mass of soil that is within the influence of the drain, making it all, after a season or two, light, mellow, and wholesome for plants."

"They form a connected tube, through which water runs with great freedom, even if the fall is very slight. When carefully laid, they will discharge water, where the fall is not more than two or three inches per mile. If buried at a good depth, they can scarcely be broken; and if well baked, are not liable to moulder away. There seems no reason why well made drains of this kind should not last for a century. The pipe tiles are used of from 1 to 1½ inches diameter of bore for the smaller drains, and for the larger up as high as 4 or 5 inches. They are all made in pieces of from 12 to 14 inches in length. An inch pipe will discharge an immense quantity of water, and is quite sufficient for most situations. These small drains should not ordinarily be carried more than 400 to 500 feet before they pass into a large one, running across their ends. Where a very great quantity of water is to be discharged, two large-sized horse-shoe tiles are often employed, one inverted against the other.

"Third, as to the direction in which the drain should run. The old fashion was to carry them around the slopes, so as to *cut off* the springs; but it is now found most efficacious to run them *straight down*, at regular distances apart, according to the abundance of water and the nature of the soil. From 20 to 30 feet between them, would probably be the limits for most cases. It is sometimes necessary to make a little cross-drain, to carry away the water from some strong spring. In all ordinary cases, the drains running straight down, and discharging into a main cross-drain at the foot, are amply sufficient."

"Tile machines are now introduced into this country, and tiles will soon come into extensive use. Their easy portability, their permanency when laid down, and the perfection of their work, will recom

mend them for general adoption. It is also to be noticed, that it takes less time to lay them than stones, and that the ditch required for their reception is smaller and narrower. The bottom of it need only be wide enough to receive the tiles. The upper part of the earth is taken out with a common spade, and the lower part with one made quite narrow for the purpose, being only about four inches wide at the point. The bottom is finished clean and smooth, with a peculiar hoe or scoop. This is necessary, because the tiles must be laid on an even smooth foundation."

Cultivation of Oats.

OATS are grown more widely, perhaps, than any other grain crop; and on good soil, with fair cultivation, produce good, remunerative crops. It (the oat) has fewer enemies than most of the cereals, and may be raised with less labour than any of them—in fact, so easily are oats raised, that very great negligence prevails in almost all parts of the country where they are grown, in properly preparing and enriching the land. It would seem that a crop which is so universally grown as to exceed the wheat crop of the country by over a million of bushels, according to the census statistics of 1860, would receive better attention; but a notion prevails that the oat has strong assimilative powers, and it is best to use it to extract the little remaining fertility of an almost exhausted soil—at least such might be inferred from the course of culture pursued too often.

SOILS AND THEIR PREPARATION.—Oats thrive the best on a rather moist soil, of a somewhat closer, heavier texture than required for the best crops of corn. The ground should be ploughed as soon after the frost is out as it will admit of working *well*; plough deep and with a narrow furrow slice; no matter if a small quantity of subsoil is brought up, as the oat will bear it better than most other crops. The frosts of winter have the effect to loosen the soil, and leave it in a favourable condition, so that teams, fresh and strong, will better perform their part in deepening the soil than at any other season of the year. The judicious farmer should ever keep in mind that it is better to add to his farm by deepening the soil than in adding to the acreage. I should have said before that oats should follow some hoed crop, properly.

VARIETIES.—Every section has, or is supposed to have, its favourite variety, which has some fancied or real quality better than any other, and that variety is generally cultivated to the exclusion of others. It would therefore be vain to recommend or say that any particular variety was best; but all agree, I believe, that the heavier the grain weighs the better, as a general rule. Oats, long grown on the same soil, unless particular pains are taken in selecting and saving seed, are liable to deteriorate in quality, and an advantage is often derived in obtaining seed from cooler localities.

SELECTING SEED.—A great failing, too common among farmers and cultivators generally, is the want of care in selecting and saving seed for future use. In selecting oats, the heaviest, brightest and plumpest only should be used. Take the best to be had and assort them in one of the following ways: By throwing them across a long floor, retaining only those which go the farthest; the lightest will fall short—by running them through a fanning mill turned rapidly to blow over the lightest; the heaviest and best will run down, and those only should be used. To procure seed at first, this is the best way, but when a crop is grown, the better way is to take from the best part of the field that wanted for seed. Take the bundles and whip them across the head of a barrel, and select therefrom such as will readily shell out, and divide still farther as before. In this way the standard weight may be kept up indefinitely, and an improvement oftentimes made on the original. Were farmers to use similar care in selecting seed of all kinds, there would be less complaint of the products being of poor quality as well as quantity.

SOWING.—The seed should be sown as soon after ploughing as practicable. Drilling in seed, sowing broadcast, harrowing in and ploughing in, are the different ways practiced in different sections and by different cultivators. For several reasons, I give the preference to drilling in the seed, for by so doing the quantity per acre can be more exactly regulated; the covering is more uniform than by the other methods; the seed is more uniformly distributed than in hand-sowing. Being covered uniformly, it comes up simultaneously, and does not present the spotted appearance which is otherwise often seen. There is also less liability to lodge than hand sown, even when sown on similar soil side by side. It will usually pay to let the land lay long enough to dry sufficiently, and roll it to break down any clods, and fit a good seed-bed, then drill in the seed; the depth to be governed by the soil,—from one to two inches, and finish off with the roll. In sowing broadcast, the seed is put on immediately after ploughing, and harrowed twice ever-length and crossways of the field, followed by the roll to finish off—an important item to help keep down the weeds and facilitate in harvesting the crop. Ground liable to have standing water should be underdrained, or, at least, water furrows should be opened after sowing, to conduct the water off; for no kind of grain is expected to thrive where water is allowed to stand upon it, if we except rice. Different cultivators use from two to four bushels of seed per acre. As a general rule, the better and heavier the soil, the more seed it will bear; a safe average amount would be three bushels. The earliest sown produces the best crop, both as to yield and weight; the latest the next, and between, the poorest.

HARVESTING.—Oats, unlike wheat and rye, are better and heavier for not being cut too green, although the straw is less valuable for fodder; being cut green, they pack closer, do not cure as well, and are liable to injure in the mow or stack. The best way of cutting is with the grain cradle, which leaves them spread thin in the swath, and gives an opportunity to dry so as to be gathered, bound, and put in the stack or mow, without danger or injury, as is too apt to be the case when cut with the reaping machine, and thrown off in "gavels." In the former case, if wet, they soon dry out, often without turning; but in the latter, they require to be spread. The straw of the oat will retain wet with much greater tenacity than that of any other grain. The grain is bound in suitable-sized bundles, and set on the butts to sun and dry a few hours, and then either carted to the barn or shocked in the field, where they may remain in perfect safety for some weeks. Lay three or four sheaves in the centre, so that the heads will not come in contact with the ground, which is easily done by weaving them together; build around these in a circle, keeping the heads of the bundles higher than the butts, and in the center; keep the sides perpendicular to the desired height; then draw in evenly, and finish off with a cap sheaf, set and bound on firmly.

THRASHING.—The old modes of thrashing with the flail, and tramping out with horses, have given away to the improved machine driven by horse or other power. An important part is cleaning the grain, as a nice, clean article will always command a ready sale, and a better price, than an equally good article mixed with dirt, chaff, &c. The grain run through the fan-mill twice—first with a coarse meshed riddle, and again through a finer,—will usually expedite the cleaning and do it more satisfactorily.

ROTATION, ETC.—Oats are generally esteemed an exhaustive crop; but when they occupy a place in a regular course of rotation, they are no more exhaustive than other straw and grain crops; but when grown, as is sometimes the case, many years in succession on the same ground with only one ploughing, and without fertilizers of any kind, the land is often exhausted of its fertility, and the soil is filled with Canada thistles, dock, and other noxious weeds, thus rendering it unproductive. There is no better grain with which to sow grass seed for stocking down than oats, and for that purpose I would grow them, seldom if ever growing them oftener on the same ground. Oats are benefitted by most of the usual fertilizers, except such as contain much nitrogenous matter or lime, they retarding the ripening, or producing a rank growth of straw, causing it to lodge. The preferable way is to enrich the soil through previous crops, getting it into good heart and tilth, not applying any stimulant to the growth of the plant. A cool, moist season usually gives us the heaviest and most prolific crops.—WM. H. WHITE, *in Country Gentleman.*

South Windsor, Conn.

Items from the American Institute Farmers' Club.

WE cull a few extracts from the report in the *N. Y. Tribune*, of the meeting held March 27:—

QUACK GRASS.—Oliver Payne, Granby, Oswego County, N. Y., inquires how to kill quack grass?

We recommend him to dig it up and burn it, smother it with manure, or kill it with salt or gas lime.

A NEW STRAWBERRY BASKET.—George H. Mellish, Paper-mill Village, N. H., sends the Club specimens of a new strawberry basket. It is a wooden bowl, holding a quart, turned out of a round stick of basswood or maple, endwise. These he offers to sell for $15 per thousand. They are very clean and neat looking, remarkably cheap, and were well approved by some of the largest strawberry growers in this vicinity. For transportation, when filled, they will have to be set in holes cut in the boards between the tiers of the cases, just as they are prepared for carrying earthen bowls. We think this Yankee notion a decided hit, and commend it to the public.

CHURNING.—Mrs. S. Haddock, Babylon, L. I., says: "If young housekeepers will scald the milk directly after straining, this will produce the sweetest kind of butter with half an hour's churning in any churn; the milk should be taken off the stove at the first stage of the scald."

MANURIAL SUBSTANCES.—What to use to enrich land, and how to use it, is attracting more attention at this time than ever before. Among a batch of letters upon this subject, the following are briefly discussed:—

A Farmer, North Parma, N. Y.: "An old ashery, near my farm, contains a pile of some 150 loads of thoroughly leached ashes, for they have been exposed about 25 years. Are they good for a young orchard? Or for oats? And should they be put on the surface or ploughed in? Are they worth as much as yard manure for my sandy soil?"

Yes, yes, yes, to all these questions, even the third one, for they may be spread on the surface of grass land, or upon oat ground, or may be lightly ploughed in with any other crop, and be worth as much as an equal quantity of manure.

D. W. NOBLE, Indianapolis, inquires the value of leather shavings for manure, and how to use them?

They are worth, we should say, $20 a ton, and may be spread upon grass, where in time they will decay, or composted with lime, ashes, muck, or strong manure, till decomposed.

HOW TO KEEP WINTER APPLES.—Dr. J. P. Phillips, New-Haven, Conn., recommends in the highest terms buckwheat chaff for packing apples or other fruit. He says: "Apples packed in it have a better chance of preservation from frost than when packed in the ordinary way. The chaff prevents rot from spreading from one infected apple to others that may be sound, owing to its great power of absorbing moisture."

WEEVIL-PROOF-WHEAT.—J. W. Smith, Clarence, Erie Co., N. Y.; "We raise, in this vicinity, wheat that is perfectly weevil-proof—that is, the field-weevil or midge can do it no harm. It yields about 15 to 18 bushels per acre. The color of the straw when ripening, is of a bright yellow orange. It is not bearded—heads rather short, produces good flour. Berry red and plump. It is about the only wheat we can raise here, on account of the destructiveness of the field-weevil or midge. It is, however, subject to smut. Does the Farmers' Club know what causes smut, and what will prevent it?"

Yes, both. Smut is a fungus plant, propagated by seed as much as wheat, to which it adheres, and is sown with it, and thus the product continued. Wash your seed wheat thoroughly in various alkaline substances—in urine, in a solution of copperas, &c., and you will kill the smut seed, and in time get it out of your fields.

Weed History.

FROM a recent issue of the *Gardeners' Chronicle* we extract the following interesting communication:—"The introduction of a new plant that takes its rank amongst our own indigenous ones should be carefully noted, or in a few years the generation will have passed away, and sometimes all record of the plant with it. Many of our so-called British plants had doubtless an European origin, and some even came originally from parts of the earth yet more distant. There are many persons still living, who remember the disastrous Walcheren Expedition; but few are aware that to the effect of this is to be ascribed the introduction of the most troublesome weed to agriculturists, saving Gravel Bine, Convolvulus arvensis, for, like it, the new comer dives deeply into the earth, from 8 to 9 feet, and cut it or break it as you will, new buds are formed and shoots developed that in time will find their way to the surface, luxuriate in leaves and flowers, from which, in due time, seeds are produced, and the race extended. All this increase by seed the husbandman can prevent, by cutting off the tops; but how is he to rid the soil of the roots thus deeply seated? Again, when the deeply seated bud has forced up a spindling weakly-looking shoot to the air, the very first effort (in which it is usually

successful) is to thrust out lateral thready roots in all directions within from 6 to 12 inches of the surface, and often extending to 6 feet and more. These ramifications are full of buds, and the second year produce a plentiful supply of herbage and flowers, as just recorded. But it is time that I explain its denizenship, and its connection with the Walcheren Expedition. When our troops returned to England many disembarked at Ramsgate; the poor fellows were suffering under malarious fever, and their beds were ripped up and the straw, &c., was placed in an old chalk pit belonging to a Mr. Thompson. Time passed on, and this heap of refuse was mixed with seaweed and manure, and finally employed to fertilise the fields. Wherever this was done a plentiful crop of the new weed was produced, and which to distinguish it was called Thompson's weed. I have traced its introduction, and its spread over many parts of the Isle of Thanet—it now remains to show its subsequent progress. It seems to take to the banks of ditches, the edges of footpaths, &c., in preference to the open fields, and may be traced through Canterbury, Chatham, Sittingbourne, Gravesend, Deptford, Peckham, &c., as I have myself done; but how far it has reached towards the northern and midland counties I have had no opportunity of ascertaining. It may be well, however, for me to state, that I have measured one root in the chalk that was 9 feet long, and even then did not succeed in reaching the extremity. *W. M.*"

To which the Editor replies: "Our correspondent does not name the plant to which he alludes, but we suppose he refers to Lepidium Draba. This has some good qualities, for about New Cross it helps to keep up the slippery clay banks of the railway cuttings, and to a less extent, does a similar service in places on the equally slippery gault of Folkstone."

Some Suggestions Respecting the Destruction of the Turnip "Fly."

As a preventive, we have always placed great dependance on the use of hot lime, our practice having been to apply it a short time previous to sowing, and although we have suffered severely from "the fly" when we omitted, from any particular reason, to apply lime, we were always safe when we did use it. In other cases we have known hot lime applied a few days after the turnip seed had been sown, and with uniform success. The use of manures with stimulate a rapid growth in the young plants is of the greatest possible utility, because "the fly ceases to injure them as soon as they get into the rough leaf. Keeping the land clear of charlock, &c., is most useful in preventing attacks of "the fly," as the insect feeds upon and is nourished by such plants, even at other periods of the rotation than the turnip break. "As a remedial measure," says Stephens, "a long-haired hearth brush switched along the drills by field workers would cause the insects to fall from the plants better than any board or net; and if quicklime were strewed immediately upon the plants, as recommended from the experience of 102 practical farmers of the Doncaster Agricultural Association, their destruction would likely be more certain." A "Turnip-fly Catcher" has been patented by a Mr. Morris. It consists of a light horizontal frame-work, carried by the wheels, and guided and propelled by a handle, just like a child's perambulator. A piece of light canvass is smeared with an adhesive compound, to which the insects adhere when brushed off the plants by the canvas curtain.—*The Farmer* (Scottish.)

The Roots of Plants.

How deep do the roots of wheat and clover go down under favourable circumstances? I have heard of a gentleman, who went to Dublin some fifteen or eighteen years since,, and got some of the young men in the Botanic Gardens of Glasnevin to accompany him to the neighbourhood of Swords, where they followed they followed the roots of many plants of wheat and clover more than 15 feet from the surface, that in no instance did they get the end of roots, they all broke off; that in Lord Claremont's garden they selected a plant of Indian corn and followed it down 17 feet, when it broke, to the astonishment of the gardener, who transplanted it from the green-house only four months before. I also heard that drawings of these plants were made and presented to the Dublin Society, but I have failed to find them there or anyone who seemed to care whether the went 1 foot or 20 feet down.

I once took a piece of subsoil, 3 feet from surface, of strong yellow clay, to a distinguished agriculturist and chemist in Dorsetshire, and said, "There is something that will frighten you." "Oh, no," said he, "you may do anything with that land if you don't object to the necessary expense. What do you think these are?" "They appear to me," said I, "like very fine hairs, but I suppose they are roots." "Yes," said he, "and they would not have gone there if there was nothing to eat. They would not go into my chalk subsoil." This is a subject, I think, worth more investigation.—*A Would-be Improver, Co. Louth, Ireland, May 11, 1866.*

BARLEY.—In an elaborate article on the Barley Crop, the London *Field* says:—The success of the crop depends very much on a good start obtained by planting at the right season, sowing rather thickly, having our surface well tilled and full of plant food, whilst the subsoil is dry and healthy. The object should be to grow just as great a bulk as will stand up properly. If barley is seriously laid, especially early, the loss is very great, and a first-rate sample rendered impossible. Great care is necessary in harvesting. The crop must be thoroughly ripe, in order that the corn may germinate evenly; but there is no reason why it should be left until so rotten ripe that the heads separate *en masse* from the straw, and a considerable loss ensues. There is a happy medium here, as in everything else. We must wait till the red streaks which are seen running longitudinally on the grain of the ripening barley, disappear, and the head begins to hang down, the straw being of a uniform golden hue; then we may cut, and, if sufficiently long, tie up into small sheaves, in the event of bad weather The sample is protected, and less liable to stain than if lying all about; besides, the practice is neater, and the cost of carting greatly reduced. Barley stacked loose gets into good condition more rapidly than when tied up The sweating is more uniform, and possibly the sample a shade mellower, provided the weather has favorable Still the evidence is all in favor of tying; a practice that is steadily gaining ground, especially where the reaping machine is employed. When barley is grown for meal, and not for malting, it may be cut with advantage at an earlier period. The straw will be of better quality, and the skin of the grain thinner.

Veterinary Department.

Roaring and Whistling.

DERANGEMENT of the mechanism of the respiratory organs naturally leads to the production of new and generally very unmusical sounds during the performance of the respiratory function; and although as an abstract point it might be considered a thing of no great moment that the pitch of the note emitted from the breathing pipes should be either higher or lower than natural, it nevertheless makes a very considerable difference, according to the every-day notions of practical men, whether a horse sweeps silently along or sounds an alarm every time he is made to canter. So far as the mere power of endurance is concerned, whistling or roaring may be of no consequence; but as a matter of taste, other things being equal, a horseman does not care to announce his arrival by the assistance of his steed, and hence it happens that no defect in horses is so relentlessly condemned as roaring; and the man who calmly insists upon riding one of these unfortunate animals so affected to hounds through a season makes hunting hideous, and is universally voted an enemy to his species.

Legendary historians seem to find some consolation in recording the fact that "Eclipse" was a roarer; whether with a view to enlist popular sympathy in favour of roaring in general, or to show that the defect did not absolutely ruin the reputation of that high-mettled racer, is not very apparent. But we do not want instances to prove the fact that certain unpleasant noises emanating from the breathing organs are not necessarily evidences of respiratory capacity; on the contrary, it is generally allowed that such sounds are perfectly compatible with considerable breathing powers No qualifications, however, can compensate for the annoyance to which the defect gives rise; and it is impossible to avoid looking upon the affected animal as one whose breathing organs are hopelessly diseased, and to whom sustained exertion is impossible.

To understand the difference in the degrees of roaring it is necessary to consider what causes may give rise to it—what alterations in the tubes or pipes may at different times produce the one general result, an unnatural noise in breathing. The mechanism concerned in the process of respiration may, for our purpose, be concisely described as consisting of a central organ (lungs), filled with tubes which communicate with the external air by means of a single pipe (windpipe), extending from the chest to the nostrils. In any portion of this mechanism an obstruction may occur, and cause an alteration in the pitch of the sounds produced during the passage of air to and from the central organ. Thus the nostrils, larynx, windpipe, or bronchial tubes may either of them be the seat of a deposit or derangement of some kind which shall cause the natural sound to be altered. The membrane lining the nostrils may become thickened, and thus the openings be diminished or the surface of the tube be rendered irregular. The form of the larynx may be altered in consequence of disease of the muscles on one side. The windpipe may be distorted as the result of the excessive use of the bearing rein; and the calibre of the bronchial tubes may be lessened in consequence of diseased deposits. In each of these cases an alteration in the character of the sounds emitted will be the result.

Depending upon the position and nature of the disturbing cause will be the character of the tones produced; and an animal is designated a roarer, whistler, or wheezer, according to the precise quality of the noise he makes.

It is in all cases very difficult to determine what special morbid condition causes the production of any particular sound; but generally it may be concluded that "whistling" is the result of a diminution of the space through which the atmosphere passes in the nostrils or larynx. This appears the more probable, as the noise is usually only evident during inspiration, when the apertures of the tubes would naturally be somewhat less expanded than during expiration. Roaring is more likely to be caused by a relaxed condition of the lining membrane of the windpipe or bronchial tubes, and is therefore the more serious defect of the two. It is true that under a tonic system of treatment great improvement will often be effected, and now and then it may happen that as the condition is gradually regained, the abnormal sounds will be considerably modified, or even cease altogether; such a result, however, is rare, and does not affect the general rule—viz., that roaring and whistling are incurable diseases.

The records of veterinary science contain many instances of remarkable cures, and among them cases of roaring are mentioned as having yielded to some special system of treatment. Firing, as a remedy, is lauded by some experimenters, who profess to have perceived great benefit to result from the operation; but we confess that the puzzle to us would be to select the proper situation for its performance. The larynx might be suggested as a probable seat of disease, and powerful counter-irritation applied to the skin of the throat might be followed by an amelioration of the severe symptoms; but, excepting in those few cases where there is good reason to conclude, from the previous history of the case, that this or some other accessible part is the seat of disease, local treatment is at best but empirical, and although an occasional success may be recorded, we fear it would stand amongst a crowd of failures if these were recorded also.

Judicious management in the way of feeding, grooming, and exercise, may do much towards preserving a "roarer" in the best condition for a long time. Medicines should be exhibited sparingly, and should generally be tonic in their action. The compounds of iodine have in many cases appeared to produce good results, though, to secure the full benefit of their action, they must be perseveringly used; as they may be administered in the food. however, there is no difficulty in continuing their employment for a considerable period. Iodide of potassium, in doses of half a drachm, with nitrate of potash one drachm, and sulphur two drachms, may be combined, and given in the food, either mash or corn, and repeated three times a week, until some improvement takes place, when the medicine should be discontinued for a time, and again employed in the same manner so long as any benefit appears to attend its use.

If there is reason to believe that the roaring is the result of irritation or thickening of the membrane of the larynx, windpipe, or bronchial tube, counter-irritation by the ointment of the biniodide of mercury may be had recourse to over the chest, front of the neck, or under the throat, according to circumstances.

Detection of roaring or whistling is not generally a matter of difficulty. Observers may differ as to the kind of noise which an animal may utter, but seldom can any doubt exist as to the fact of a noise being made. It is not, therefore, easy to understand how "doctors" can differ about so commonplace a matter we come to learn that the patients differ also, and that the roarer of to-day may be the perfectly sound horse of to-morrow.

Under the head of the methods of detection we hope to throw some light upon the discrepencies so commonly remarked in the evidence of professional men upon this constantly recurring question, by narrating some few instances that have come under our own observation, in which. In the absence of previous knowledge of the history of the animal, it would have been impossible to form a correct opinion.—*The Field.*

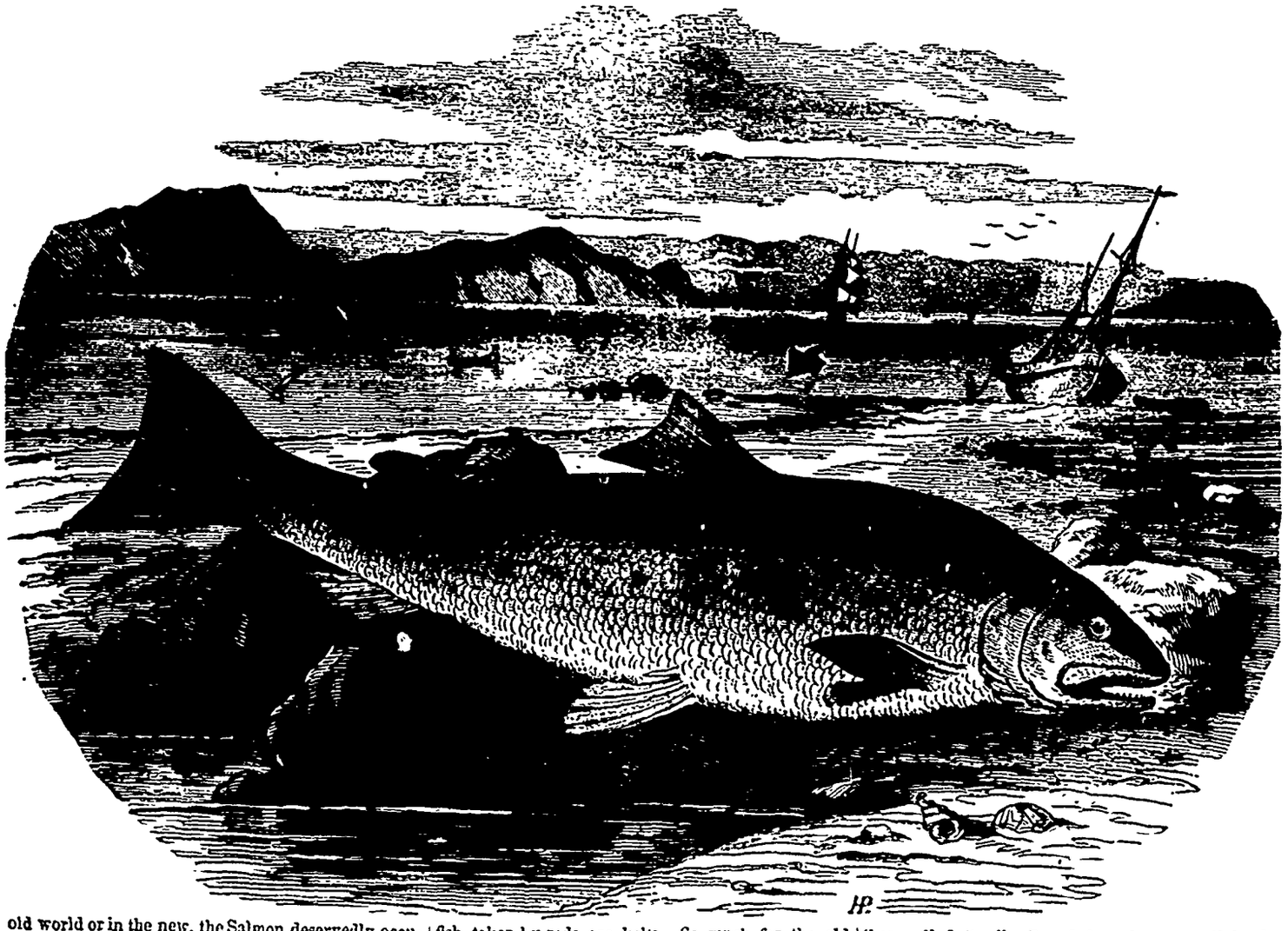
Canadian Natural History.

The Salmon.

(*Salmo Salar.*)

Hitherto, in our sketches of Canadian Natural History, we have purposely confined ourselves to animals and birds. To have described our native fishes while the ice king held sway, would have been to deprive our readers of the immediate opportunity of verifying our descriptions by their own observations and researches. With the arrival of the genial summer-time, however, when our rivers and creeks are swarming with fish, and net and rod and line are put into requisition for the capture of the finny prey, the objection no longer holds good.

Among all fresh water fishes, whether found in the old world or in the new, the Salmon deservedly occupies the first place. Its wariness, its subtlety, its strength, its determined courage and endurance, as well as the unsurpassed quality of its flesh, place it without a rival. The life-history of the Salmon is interesting, and some of its stages, even at the present day, are involved in considerable obscurity. Without presuming to advance any theory of our own, we will briefly attempt to record the history of a salmon from its earliest entrance on existence, until it has attained maturity, as ascertained by the best authorities of the present age.



The places usually selected by the parent fish for the deposition of her roe, or ova, are rippling fords or shallows, of not more than two or three feet in depth, where the gravel is clean and not too heavy, and the water clear and in constant flow. They begin by falling down a few yards below the chosen spot, and commence digging a trench, by tilting up against it with their heads, thus displacing the gravel and forming their first parallel. The excavation varies in depth from nine to eighteen inches, according to the nature of the material or the requirements of the situation, of which, no doubt, the fishes themselves are the best judges. When the trench is sufficiently deep, the female deposits in it the ripest portion of her ova, and the male sheds his milt among them. A careful observer may perceive both products falling into, and settling at the bottom. As soon as the respective deposits are made, another tilting takes place against the gravel, which has the effect of not only covering the ova deposited, but of forming another parallel. They then drop down stream and rest, and soon after find their way to the salt water. By the time they reach the sea, much of their fine lustre—destroyed by the spawning process—is restored, and they are then known in Scottish parlance as "weel mended kelts." The majority of early spring fish, taken by rods, are kelts. So much for the old fish; let us now enquire after the spawn.

The period required for hatching the ova varies with the season and time of deposition. If spawned early, the fry appear in from 90 to 100 days. When they first emerge, they are very slender, but extremely agile little things, about three-quarters of an inch in length, and with none of their fins developed except the pectoral. Beneath the body, a comparatively large bag of beautiful transparent red substance—resembling a pale coloured currant—is attached to the abdomen, affording the young fish nourishment for several weeks. As the contents of the bag are assimilated, it gradually approaches in colour the rest of the body, and in from 27 to 50 days it entirely disappears. In this stage of its existence our young Salmon is called by several names—"parr" being probably the most popular. This period continues about one year, and it is somewhat remarkable that of the "parr" hatched together, all do not change into the second or "smolt" state at the same time. Frequent controversies have been waged on this stage of the Salmon's history, and few naturalists seem able to decide positively whether certain fishes are young salmon—or a distinct species to which the name of Parr has been attached.

In the second or smolt period, the scales, and many of the specific forms and colours of the Salmon show themselves. The fish now seeks the salt water, going down rivers to the ocean, and remaining there during winter. So salubrious is the sea, so enlarging the influence of its wide domain, that no sooner has a smolt of a very few ounces in weight been launched into that vast briny abyss, than it suddenly expands in growth, even as the children of the Anakim. In a short time it will weigh more pounds than it previously did ounces. After remaining absent a few months, they return to the fresh water. They are then called "*grilse*," and have became sufficiently matured to breed.

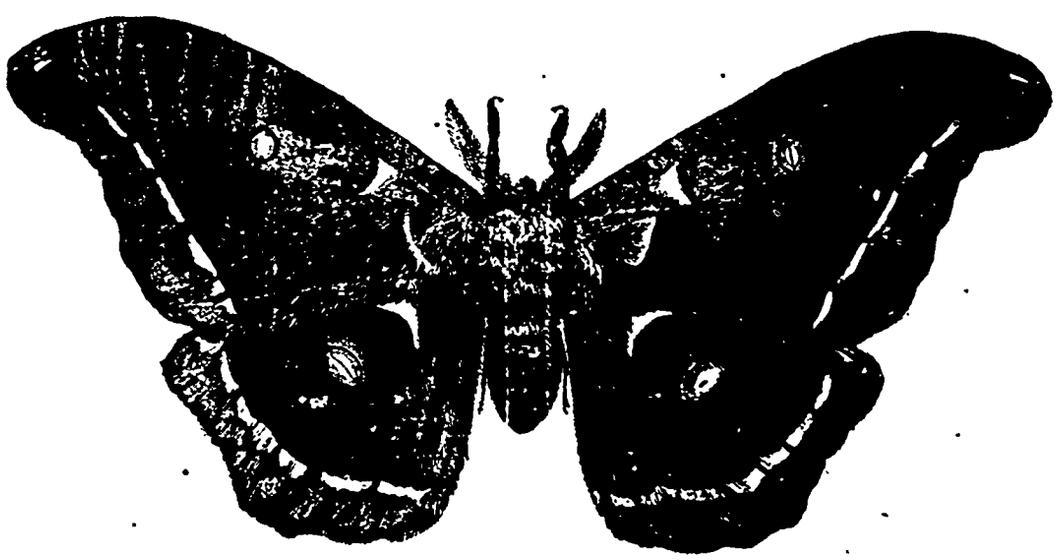
The Salmon is emphatically *the* angler's fish. Possessed of a most rapacious appetite, he readily seizes the gaudy fly which the expert piscator has deftly dropped with gossamer lightness in a mimic whirlpool, or a circling eddy. The well-known "twist" of the angler's wrist fixes the barbed hook in the red gills of the scaly victim, and the struggle begins;—for not without fierce and determined resistence is the stream-monarch going to be brought to bank. The firm nerve, the educated eye, the most skilful and delicate manipulation are necessary if the tackle be fine and the fish large. Under such circumstances, hours are sometimes necessary before he is overpowered, and even then he must be piloted to the edge of the stream with the "eye of faith and the foot of instinct." We once, in a North of England stream, "worked" a fourteen pound Salmon by means of a

small rod and very delicate tackle, for over four hours, and finally succeeded in bringing him to basket. And some years ago, a military friend of ours, hooked a sixty pounds fish about 4 p. m. on a July afternoon, and "played" the monster up-stream and down-stream till nightfall. Every artifice known to both angler and fish were put in requisition. Several times did the Salmon throw himself out of the water, as if with an effort of intelligence to smash the tackle. Then he turned sulky, and as darkness approached, he sank like a stone to the bottom of a dark, deep pool, and sullenly refused to move. Stones were hurled in beside him, but to no avail. Our piscator, therefore, seated himself on a stone, lighted his pipe, and philosophically prepared to wait till it again should suit the pleasure of his majesty of the stream to move. Daylight found the fish and the fisherman in the same relative positions. Towards 8 a. m. a party of fellow-anglers rendered assistance, and the fish was safely captured. He was a noble fish; and testified by his size, courage and endurance, to the skill of his captor.

Entomology.

Silk-producing Moths.

Mr. William Paterson, of Ramsay, C. W., has sent us, for identification and notice, a whitish tough oval cocoon, composed of fibres of silk firmly agglutinated together by a gummy substance; it is about an inch and a half long, and at the first glance, bears considerable resemblance to a discoloured egg, which he not unnaturally supposed it to be.



There are two of our largest and handsomest moths whose caterpillars produce cocoons of the kind before us. In their larval and pupal states they are remarkably similar, in deed their cocoons can hardly even be distinguished; but the moths themselves are as different in shape and colour as can possibly be conceived. One of them (*Tropæa luna*, Hübner) is by far the most lovely insect we have in this country, and is most appropriately termed "the Queen of the night." Its wings are of a delicate pale green colour, edged with purplish-brown in front, and expand to a width of about five inches; the hind wings have the ends prolonged into long curved tails often an inch and a half in length. Near the middle of each wing there is a small transparent eye-like spot, surrounded by wings of different bright colours, the body and inner edges of the rings are covered with white wool-like hairs. Its caterpillar is pale green, and feeds during the summer months on walnut, hickory, and a few other trees; the cocoon remains on the ground among fallen leaves all winter, the perfect insect coming out about the end of May or beginning of June.

The other moth (*Telea polyphemus*, Hübner) into which the cocoon before us may possibly turn, is of quite a different shape and colour from the Luna moth. The hind wings instead of being tailed, are almost square, and have a large spot in the middle of each very much resembling that at the extremity of the tail feathers of a peacock; all the wings are yellowish, with various minor markings. The accompanying illustration will render unnecessary any minute description of this very handsome insect.

The caterpillar of the "Dyed Emperor," as this moth is popularly called, feeds on oak, elm, basswood, walnut, and many other trees. It is not at all uncommon, but may easily be collected and reared. As we have already noticed in this journal (vide page 30 of this volume), the manufacture of silk from its cocoons has lately been successfully attempted in the United States, and we can see no reason why it should not form a profitable branch of industry in this country. The difficulty of dissolving the gummy substance by which the silken fibres are so closely united together, may be overcome in the following simple manner.—"Boil the cocoons two hours and a half with 25 per cent. of their weight of white soap, and sufficient water to submerge them entirely. This operation should be repeated a second time, with 10 per cent. of their weight of carbonate of soda, for one hour." This receipt we give on authority of Dr. Morris, of Baltimore, U. S., but we have not yet tried it ourselves; we should be very glad to learn from any of our readers who feel inclined to try the experiment, whether it is efficacious or not.

There are two other other silk-producing moths common enough in this country, of which good use might also be made, viz., *Samia cecropia*, Hübner, the largest of all our Lepidoptera, and *Collosamia promethea*, Drury.

Apple-Tree Bark Lice

Mr. Del. Harwood White writes from Douglas Harbor, Grand Lake, New Brunswick, asking information from us respecting the lice on apple-trees. He states that he has "a young orchard of one hundred trees, which, until two summers ago, were very thrifty, but now most of them have lice on them. Some of the trees are completely covered with them. The lice have killed some of the trees, and unless he can hear of a remedy, he fears that he must lose more of them."

Of all the numerous enemies that the apple-tree has, the minute insect referred to by our correspondent is perhaps the most pernicious. Everywhere throughout the British Provinces and the Northern States, where the apple is cultivated to any great extent, it appears to infest the orchards, destroying many trees, and injuring many more. A description of this well-known pest would be superfluous here, suffice it to say that it appears in the form of small brown scales, in shape somewhat like an oyster-shell, affixed to the smooth surface of the bark, usually in enormous numbers. In the spring, the eggs are covered by these scales, between thirty and forty being usually under each, though often very many more; from these the larvæ are hatched out in the spring. At first, the young are whitish in colour, very minute, and nearly oval in form; they move about for some days, but afterwards become stationary, and (usually in June) exude a quantity of bluish-white down, prior to completing their transformations. The males acquire a pair of wings, but the females are wingless, and lay their eggs in the place where they have been feeding. When this work has been accomplished, the mother dies, and the dead relics of her body form the scale-like covering which protects the eggs till the next brood is forthcoming. There are usually at least two broods in the year.

A large number of remedies for this noxious insect have been put forth from time to time, some of which are utterly useless, while others are more or less efficacious. In our last issue, among other "Precautions against Destructive Insects," we mentioned two simple remedies for Bark Lice which have been highly recommended; we beg to refer our correspondent to these. We have since observed in the *Practical Entomologist* that kerosene oil has been used with advantage, when the insects do not infest the whole of the tree, but only a few branches. Any one covering the whole of a tree with oil, would undoubtedly find the remedy infinitely worse than the disease.

In the conclusion of his letter, our correspondent states that "last year he tried boring into the trunks and filling the holes with sulphur, but it had no effect." We should think not,—as far at least as the insects are concerned. This is an old nostrum, now completely exploded. It used to be highly recommended for the extermination of the Tent caterpillar, but of course without any real success. Dr. Fitch, in his second Report, gives an account of a series of experiments he mad with sulphur, applied to the trees both internally and externally. The conclusion he arrived at was that so far from being in the least degree prejudicial to the caterpillar, the sulphur had rendered them more healthy and robust, rapidly accellerating their growth! And hence it is quite probable—he adds—that those hundreds of persons in our country, who have spent more or less time in inserting sulphur in the trunks of trees infested with worms, have hereby benefited these vermin more than they have injured them."

Killing the Insects.—An exchange says that a gentleman in New Jersey saved his plums by the erection near the trees of what he called "altars," whereon blazing fires were lighted in the evening and early morning during the flight season of the curculio moth, the result being the destruction of millions of moths by fire and a more bountiful crop of unpierced plums than had ever been produced in that neighborhood.

Poetry.

Evening.

The stream is calmest when it nears the tide,
And flowers are sweetest at the eventide,
And birds more musical at close of day.
And saints divinest when they pass away,

Morning is lovely, but a holier charm
Lies folded close in Evening's robe of balm;
And weary man must ever love Her best,
For morning calls to toil, but night to rest.

Stock Department.

Chloroform and the Cattle Plague.

Chloroform is the latest remedy for cattle plague and a correspondent of the *Norfolk Chronicle* writes of it as follows:—

The most hopeful of all the remedies yet proposed for the cure of the cattle plague seems to be chloroform, which has been tried with marked success by Dr. Dickson, author of the "Fallacies of the Faculty." I say the most hopeful, though doubtless many will shake their heads, having long ago lost heart and faith in so-called specifics, even in the latest, Mr. Worms treatment by assafœuda; yet if I am right as to the true nature of the disease and its primary symptoms it is the most hopeful. While medicines for the most part fail because they do not touch the disease, chloroform seems by a short cut to come on the track of it, and suspends its undermining and death-working operations. Moreover, it is as subtle as the subtle poison itself, instantaneous in its action and instantaneous in its results—very important points in such a disease: pain of course ceases, and appetite returns, as we shall see.

First, then, as to the facts. If my memory serves me, Mr. A. Hammond stating that acting under Dr. Dickson's advice he saved, by chloroform, a great portion of his valuable herd; and last week there was a most interesting account by Mr. Blyth, who saved his cows—the only animals he did save—by the same treatment, and all for the small sum of about fourteen shillings. Mr. Blyth spoke, as he himself said, practically, not scientifically; nor did he pretend to say chloroform was a specific, only it was worth a trial. There is no doubt the disease upon his cows was fever, which, unchecked, would have unmistakeably resulted in, if it was not actually *Rinderpest*. In this opinion the inspectors in attendance agreed, and though they at first pooh-poohed the use of chloroform, yet they were equally satisfied with himself that the cows were entirely cured by means of it. At first none of them knew how to administer it, but at last, as it was found impossible to give it in a standing position, the cows were cast. Was this really necessary? I have been told that the best way is to fill a nosebag *lightly* with hay and sprinkle the chloroform (say an ounce) on it; then tie the nosebag on as usual; the beast must inhale the contents and so goes down of itself; the effect takes place in about five minutes, and lasts from ten to fifteen. Mr. Blyth found eight to twelve doses requisite, and these extended over fourteen to sixteen days. Now as to the reasons. Did the doses of chloroform cure? doubtless they did so *indirectly*. Some of the cows that were off their food before, as soon as the effects of the chloroform had passed off got up and were ravenous and others, which gave forth a constant low moaning which lasted upon them for hours, in about ten minutes ceased to moan, the moaning, I conceive, was but the outward expression of inward pain, and pain we know chloroform by its narcotic effects instantly stills. But what caused their appetite to return so quickly? simply, I think, the suspension of the active principle of evil, that was at work within, by which means nature recovered her failing powers, and all for the time went well again. But it was only for a time, the fever, it seems, returned in 12, 24, or 48 hours (is this the nature of the fever?) then Mr Blyth chloroformed again, and at last the fever found its master and left altogether. Mr. Blyth also states he fed his cows on oatmeal gruel, linseed tea, &c., &c., easily digestible food, by which means he was told they were kept from scouring. But was that the reason? Was it not rather that the chloroform suspended the action of the poisonous matter which is the cause of the purging, purging being simply nature's elimination process to get rid of the poison out of the system. Now, whether the poison be generated by the body itself, or be imported into it, matters not; poison inhaled or engendered is the cause of all that follows, so that that point may still be left an open question. The only point I am now insisting on is whether the above is the true scientific explanation of the process of cure. It is certainly very much such a result as might be expected from the well-known effects of chloroform. There is instantaneous action and instantaneous relief, and the relief comes in two ways—there is not only arrest of the action of evil, but there is also reaction for good; for I learn from another source that profuse perspiration follows inhalation, and I have all along held that cutaneous action is one of the first requisites. It seems, therefore, to me that chloroform cures in both these ways, in stopping evil and assisting nature to work her own cure, by opening the pores of the skin, the safety-valve of the system, so that the poisonous gas may escape before it has done its deadly work.

Mr Pridgeon remarked that he had tried chloroform on a heifer but the animal died, and that subsequently he treated a cow, but he was obliged to have her killed. It would have been a satisfaction to know in what stage of the disease the chloroform was administered, and whether it was administered properly; and also whether and how often it was repeated. If I am right in saying the main use of chloroform is to suspend the action of evil, it must be borne in mind that the disease may have got too much ahead for nature to recover herself, and restore her depressed vital force. Mr. Blyth, I observe, calls the disease in his cows *fever*, just as Mr. Woods calls the prevailing disease in sheep *fever*. Would'nt it be better to call the disease *fever* and not *Rinderpest*, which word now, like cholera, frightens a good many nervous people; but perhaps, after all, that's the intention of it—"to name by wit, and laugh to find it gain."

Pig-Feeding.

"Under proper management," says the Editor of the London *Field* in reply to a correspondent, "pig feeding will be found profitable even though we have to purchase the food. As to the particular mixture best adapted for growing and fattening pigs, much depends upon the state of the markets. There are one or two articles, however, that may be specially alluded to, because they are not generally known. The first of these is the comparatively new food, palm nut meal, obtained from grinding the African palm-nut kernels, which are extremely rich in fatty matter; the whole nuts contain between 55 and 60 per cent., and of this upwards of one-third remains in the meal. This fatty matter is quite solid at ordinary temperature, and much resembles lard in appearance, and is almost identical in composition with butter. The influence of such an ingredient on the health and growth of a young animal is very marked. All our natural foods are rich in such materials. The value of milk as an article of nutriment greatly depends upon the presence of the fatty globules and the saccharine principle, both of which are largely represented in this meal. Of course it is necessary that the flesh-forming element, the nitrogenous compounds, should be present, in order that a food may be complete as aliment for growing animals. We have in palm-nut meal as much nitrogen as is found in good barley meal, and, lastly, we have no more woody fibre (useless insoluble matter) than in the best linseed cake. Our opinion on the value of this for pigs is not merely theoretical; if so, it would be entitled to no weight. Analytical results are not always a safe criterion as to feeding value. Two descriptions of food may appear by this test equally nourishing, and yet the results may differ widely in consequence of mechanical differences rendering one more digestible. The value of this meal has been proved by practical experience, both as carried out by ourselves and others. We remember one very striking case, in which the pigs (porkers) were being fed on a mixture of ground wheat and palm-nut meal. The former fell short, and in the interval before more could be obtained the pigs got nothing but the meal. They improved in so marked a manner that the gentleman determined to finish them off with nothing but the palm meal, which he did most successfully. Now, it is our belief that a handful of this meal distributed through the wash and grains on which stores are commonly fed would produce a marked effect and be found a cheap addition. Although comparatively a new article, having been introduced about two years, the demand is so considerable and the supply so limited that it is with difficulty customers are supplied. This difficulty has lately been increased by the loss of a large quantity of kernels at sea. The meal is made by A. M. Smith and Co., Liverpool, and the present price is £7 a ton.

Another article that might be more frequently used is Indian corn which, when good, is capital pig food, especially suited to growing animals. When this article can be bought at from £6 5s. to £6. 15s. a ton it will do. Some give it raw, throwing the corn down on the floor—a bad plan, as the hard skin is very indigestible. Others soak it first, which is better; but the best of all is to grind it fine and mix it with other materials. Barley, when low, should form the staple of our mixtures. The store must live principally on offal and natural food. It is doubtful policy to cook much for store pigs; at any rate the food should be given cold. If we have potatoes or other roots they may be steamed or boiled. The pigs should find great part of their food in the fields. When well rung they may be turned out in grass or clover, folded if necessary, and night and morning receive a small quantity of their food. They are thus kept growing, and are far more likely to do well than if always confined. Mangolds in summer are excellent food for store pigs. It may not be generally known that the pig prefers his food sour to sweet—so far convenient that we may mix up any quantity of stuff without fear of waste. The art of breeding and feeding is to keep the store always improving, never allowing it to get into the hungry, hollow-bellied beast which most have seen. A small quantity of extra food, say 8lb. to 10lb. weekly, will keep the pig thriving. The improvement in the animal and the value of the manure will leave a good return for the money."

Pigs—Success in Raising.

A correspondent of the *Prairie Farmer* gives the following experience about raising pigs:—"Your correspondent wants to know what is the matter with his pigs that they all die, and particularly the best first. I had the same trouble for years while I kept sows in pens and fed exclusively on corn. I got almost discouraged in trying to raise pigs. One sow was kept until she had one hundred and twenty-seven and she did not raise twenty-five in all that time.

"A few years since in building a new barn-yard fence, my pig-pen interfered so I pulled it down, intending to rebuild it at some future time. In the meantime I allowed my hogs the range of a four acre clover lot in summer with use of the barn-yard and straw stack summer and winter. I fed a few beets in winter, and most of the corn fed to them went through my neat cattle. I have also reduced the Suffolk in the stock with a cross of the Chester white. And now I have no trouble in raising pigs, and my neighbors compliment my hogs and ask what breed they are of, &c., &c.

"I never allow my hogs to root a great while at a time; sometimes I cut the nose and sometimes I ring with wire. Could I have a ring where both ends would turn in the snout I should prefer it to cutting, as when cut young they sometimes grow up, and when re-cut break out at one side."

Dogs—Protection to Sheep.—A. A. Stewart, De-Graffe, Ohio, writes to the Farmers' Club that he is satisfied that no dog law, however stringent it may be, will ever be properly enforced. Therefore farmers must seek remedies from some other source. He states that three remedies have been employed with good success in his vicinity, which are powder and lead, strychnine, and fox hounds. The last mentioned I consider the most effective. A pair of active, pure-blooded fox-hounds can be trained so that they will be a terror to all straggling curs that may come within their reach. By their scent they detect the presence of a cur at a great distance; and one note of their music is sufficient to send the wandering thief flying homeward, perfectly terrified. We have kept fox-hounds for twelve years past, and have never lost a sheep by sheep-killing dogs. I have never known a fox-hound, after he was one year old, kill a sheep.—I allude only to pure-blooded fox-hounds. Any mongrel cur will prove to be a sneaking, contemptible sheep-thief.

Good Growth.—Mr. E. B. Perry, of Rhode Island, is interested in the recent statements from our correspondents as to the weight of young cattle, and says he has a Short-Horn bull calf, four months old May 4th, which weighed on that day 418 pounds, and measured 4 feet 6 inches in girth. On the 30th of April he weighed 396 lbs., thus gaining 22 lbs. in 4 days, or 5½ lbs per day; and "if any one has a calf of either sex that girths more, weighs heavier or grows faster, in proportion to age," Mr. P. would be glad to get the figures.—*Country Gentleman.*

Five Lambs at a Birth.—The Berlin *Telegraph* says:—A ewe, the property of Mr. Ephraim Wilson, jr, about four miles from Berlin, gave birth a few weeks ago we are told, to five lambs!—three black and two white. They were all born dead and the ewe died shortly after giving birth to them.

The Dairy.

Great Dairy Farm.

THERE Vermonters—two named Shafter, and one named Howard, are, undoubtedly the largest dairy farmers in the world. They have a farm in Marion county, California, known as Point Reyes Branch, on the coast, about twenty-five miles north of San Francisco, of over seventy-one thousand acres of land, and being bounded on three sides by salt water, it receives the benefit of the fogs and moisture of the Pacific ocean, which keeps the feed good for dairy purposes fully eight months in the year. The other thirty-one thousand acres is a wild, and in many parts a heavily timbered country, but some ten thousand acres of it are well adapted for sheep grazing; they having nine thousand running thereon at present, that thrive on the land the year round without care, except herding at night. These farmers expect, within three years, to be milking upwards of four thousand cows, "twice a day." Mr. Howard, who has been east this Summer, to visit friends in his native State for the first time since he went to California, has recently been inspecting the cheese manufactories in New York, Massachusetts and our own State, with a view of building one on their farm. He has adopted plans for erecting one of a thousand cows' capacity, to be put in operation next Spring, they being the pioneer there in that business.

But the making of butter is the principal business on the farm; the establishment of a cheese dairy of one thousand cows being an experiment the result of which will influence future operations into this line. With such an example before them as a butter dairy of three thousand cows, we should suppose that the people of the young and growing State of California would not long import one half the butter they consume, as at present, but would soon supply their own market, for Mr. Howard informs us that they make as good as here is made, in the best dairies in California.—*Vermont Paper.*

Rearing Five Calves on One Cow.

Mr. A. S. Deane, Newlawn, Oldtown, County Dublin, writes to the *Irish Farmers' Gazette* as follows:—

At the October fair of Ballinasloe, in 1863, I purchased a lot of three-year-old heifers at £11 10s. each; three of them proved in calf; I sold one at £16 10s., the other two I determined to keep, and try how many calves I could rear on them. They calved in April; their own calves, and two which I purchased, were put on them; these they suckled until July, when they were weaned, and four finer calves I never saw. Four more were then purchased, and very little difficulty experienced in reconciling the cows to them, these were kept on until October, when they were weaned, and two more purchased; one of these died a few days after coming home, having been unwell from the day it was bought; the cow for which it was intended was milked up to March, and the other suckled her calf to about the same time, with the exception of the last, the calves were at large with the cows on the grass. The cows were sold fat before last October, one at £21, the other at £19. One of the best of the calves died this spring of black-leg, the only case I had for some years, and which I confess alarmed me at the time, as I had a greater number than usual of young stock. The stock, reared as I have described, are at present far superior to those I have which were hand-reared, and would at present sell in any fair for £10 each, though the youngest will not be two years old until next October.

Jersey and its Cattle.

A WRITER on the Island of Jersey, in the Paris *Journal d'Agriculture Pratique*, ascribes the origin of the Jersey cattle to a remote cross between the Norman and Bretagne breeds. He is rather severe upon their merits, except for "rich proprietors who farm for their amusement," and thinks the herbage and climate of the Island ought to be imported with the cattle in order to preserve the qualities for which they are noted. There were exported from the Island in 1863, 2,011 cows, and 2,086 in 1864, and 28 bulls each year. There is a law prohibiting the importation of cattle from France into Jersey, in order to prevent danger of crossing the breed—the penalty being fines and confiscation of both cattle and the ship bringing them. The Island of Jersey contains 29,125 acres, mostly occupied in farms of about 30 acres each, their being only one on the Island as large as 148 acres. Each includes tilled fields, pasture and fruit gardens, and the style of gardening is described as quite primitive. Sometimes eight horses are used to a plough, and always strung along in single file. Cows are tethered at pasture during nine or ten months of the year. The young cattle are said to be quite badly treated—receiving milk from their mothers only a few days—after that buttermilk, and very soon hay and straw, with a few roots. The principal root cultivated appears to be the parsnip, though other kinds are also grown.

TO EXPEL VERMIN FROM THE DAIRY.—A correspondent of the *London Builder* writes:

"Some years ago I read in a French scientific periodical, that chloride of lime would rid a house of all these nuisances. I treasured up the information until opportunity offered for testing its value, and this occurred some four years since. I took an old country house infested with rats, mice and flies; I stuffed every rat and mouse-hole with the chloride. I threw it on the floors of the dairy and cellars. I kept saucers of it under the chests of drawers, or some other convenient piece of furniture, in every nursery, bed, or dressing-room. An ornamental glass vase held a quantity at the foot of each stair-case. Stables, cow-sheds, pig-sties, all had their dose, and the result was glorious.

I thoroughly routed my enemies, and if the rats, more impudent than all the rest, did make renewed attacks upon the dairy in about twelve months, when probably, from repeated cleansing and brushing, all traces of the chloride had vanished, a handful of fresh again routed them and left me master of my own premises.

Last year was a great one for wasps; they wouldn't face the chloride; though in the dining-room, in which we had none—as its smell, to me most refreshing and wholesome, is not approved by all persons—we had a perpetual warfare. And all this comfort for eightpence! Only let house-wives beware that they place not the chloride in their china pantries, or in close proximity to bright steel wares, or the result will be that their gilded china will be reduced to plain, and *their bright steel fenders to rusty iron, in no time.*"

Poultry Yard.

In-and-in Breeding.

THERE is no subject on which the different rearers of improved breeds of domesticated animals are more at issue than that of the good or evil effects of "in-and-in breeding."

One party maintains that size, vigour, fecundity, and constitutional hardihood are inevitably sacrificed if there is not an introduction of fresh blood into every strain. The other, on the contrary, proclaims as stoutly that if you wish to maintain a breed in its purity, no admission of fresh blood must be permitted. And both, strange to say, adduce facts in support of their diametrically opposing positions. The general impression is in favour of the introduction of fresh blood, particularly with regard to breeds of poultry, although some of the more successful exhibitors are particularly cautious not to admit any strange stock into their strains. One of the strongest evidences of the possibility of rearing first-class stock from the same strain for many years in succession has just been published by Mr. Charles Ballance, formerly of Taunton, Somerset, a gentleman who, for many years, was among the most successful rearers of Malays. Writing respecting this breed in the current number of *The Poultry Book*, he says:

"There is one remark I should like to make for the benefit of amateurs, now that my opportunities for exhibiting are likely to be few and far between. It has reference to what I believe has been the secret of the success I have experienced with Malays, both coloured and white, for a period of nearly thirty years. During the whole of t' is period I have never allowed the introduction of any fresh blood by crossing with any other strain of Malays, but have kept entirely to my own; and as I have succeeded in winning more prizes with Malays than any other fancier of these much-abused but most valuable birds, in all parts of the kingdom, I think my experience is not to be despised, as testifying to the fact that breeding in-and-in does not necessarily deteriorate the birds who may be subjected to this operation; but then all depends upon how the breeding in-and-in is managed. If a person has one yard only, and allows the produce to continue breeding without any discrimination, then the worst effects will follow, and the birds get small and weedy; but my plan has been to keep about five or six distinct runs, and to rear about two to three hundred chickens each year, and select the best birds from each run for crossing, to make up my yards the next season. I thus secure sufficient crossing to prevent deterioration, and by judiciously selecting about two dozen birds, the pick and choice of nearly three hundred, I have been able to produce each year specimens for exhibition superior to their parents of the year preceding, and leaving all other competitors far in the distance. I believe the same language would apply and be found to answer with any other breed."

We believe that in this communication, Mr. Ballance has really hit the point respecting in-and-in breeding. If, as he says, a breeder has but one yard only, and allows of continued inter-breeding, without any discrimination, the worst effects will follow; but by constant selections from the best specimens of the same strain great improvements may be effected.

That the closest inter-breeding, as, for example, between birds of the same clutch—will tend to dwarf and deteriorate the produce, everyone knows; but that with a judicious selection, the evil effects generally attributed to inter-breeding are always produced is, we think, a fact still requiring to be proved. —*London Field.*

Instructions for Rearing Poultry.

CHICKENS should hatch on the 21st day, or a few hours later at furthest. Save removing the empty shells, do not interfere with the nest for twenty-four hours; then put the mother and her brood into a coop; feed with oatmeal and paring meal, equal parts, mixed with water, into a crumbling state, or bread soaked in milk and squeezed dry; give the chicks twice daily a little water to drink, but do not leave it beside them. Some writers on poultry advise the removal of the little scale from the tip of the chickens' bill, but this practice is as cruel as it is unnecessary. Where it is possible, the mother and her brood may with great advantage be placed under a shed in their coop for a few days until the chickens become strong on the leg, when they can be cooped out on dry earth or gravel. Chickens are liable to cramp, and although access to grass is advantageous, close confinement to it is not so at every time. A gravel walk near grass is the best possible site for a poultry coop until the chickens are old and strong enough to seek for shelter from damp or cold. They can then be removed to less favoured quarters, and give place to newly hatched broods. Following this practice systematically, numbers may be reared in a small space. A little fresh gravel or sand must occasionally be strewed over the ground, and it must be swept daily. It is useful to leave little heaps of sand here and there as *play-grounds* for the chickens; they scrape and half bury themselves in the dust, thereby ridding their little bodies of troublesome insects. After the third day from hatching, chickens may have an increased dietary, such as eggs boiled hard, mixed up with the shell; bread, soaked in beer; cooked meat minced, a few grains of hemp seed, buck wheat, and groats—all in addition to their former food. The hen, of course, must be plentifully supplied with the usual food of the poultry-yard. After the first week chickens may be allowed free access to water. The best water dishes are made of tin, 1½ inches deep, the middle filled up, leaving only a narrow channel for water, or what is equally good and more easily obtained, flower-pot saucers inverted one into the other. The weather lately has been very trying for young chickens, and when cold winds prevail roup and other diseases will probably appear, with the usual fatal results; but much may be done, by care and experience, to ward off malady. Put into each drinking vessel a piece of camphor, and as it dissolves replace it. If the weather is damp, dust a little pounded pimento into the food, in the proportion of one teaspoonful to twenty-four chickens. For the first week do not allow the hen to leave her coop, unless you can put her under cover and confine her to a wired-in range. Roup generally attacks chickens when the feathers begin to appear. In my next I shall give a recipe which I have found beneficial in my own poultry-yard. In the meantime do not overstock your ground; if crowded, chickens cannot thrive. Separate your coops, and on the first appearance of disease remove the brood to a distance, and make it your special care. Mere removal to fresh ground often effects a cure. Very young chickens cannot bear much handling, and every other means should be tried before having recourse to the medicine bottle.—"The Henwife" in *The Farmer*, (Scottish.)

British Gleanings.

☞ "What is the reason that your wife and you always disagree?" asked one Irishman of another. "Because we are both of one mind. She wants to be master and so do I."

BRITISH CROP PROSPECTS.—A recent issue of *Bell's Weekly Messenger* states:—"A Norfolk farmer, writing in the middle of last week, says: 'The weather is now very fine here, warm and showery We are full of grass, and wheat and barley are looking well The young beets are coming up, and I sow my first field of swedes next week.' From Kent and Devonshire our reports are not yet very favourable. In Cheshire the early potatoes have been very seriously cut down by the frost.' A correspondent in Worcestershire says—"Grass is abundant, and my mangolds and swedes are coming through nicely.' "

HARSHNESS OF REPROOF AND ITS RETORT.—In an article on the relations which ought to exist between masters and servants *The Farmer* (Scottish) relates the following:—"It is not everyone who can 'shut-up' a scolding master as coolly as we once heard done by a farm-servant when sharply reproved by a worthy but rather hot-tempered employer for overloading a favourite mare with stones which were being carted off a field; the reprimand winding up with a reminder that 'stones were very heavy.' 'That's a fact,' replied Joe, 'Solomon says, stones are heavy, and sand is weighty, *but a fool's wrath is heavier than them both!*' "

THE DOG TAX IN IRELAND.—An exchange states that the "imposition of a tax on dogs in Ireland has had a most salutary effect in lessening the number of useless and dangerous curs which that country was formerly infested. The *Leinster Express* of Saturday draws the attention of the Directors of the Grand Canal, and others interested in the purity of its waters, to the state it is in at present near the town of Naas, owing to the number of dogs consigned to a "watery grave" in it since the dog-tax came in force At one ford on the River Liffey, near Newbridge, previous to the last flood, there were not less than one hundred dead dogs, all of which disappeared with the flood. No person except those in the country can conceive the happy riddance made of these worthless pests, as now twenty miles of road, with an abundance of cabins thereon, can be travelled without seeing one."

POTATOES AS A FOOD FOR SHEEP.—On this subject a correspondent of *The Farmer* (Scottish) writes:—"Being somewhat short of turnips this season, as soon as my hoggs were put on cut turnips at the beginning of January, I commenced to add a few potatoes, and gradually increased the quantity till the mixture was half potatoes and turnips with the addition of chaff or hayseeds, and a sprinling of salt; they were also well supplied with hay and about ¼ lb of linseed cake each. I am happy to inform your correspondent that I never had a lot of sheep that made more satisfactory progress, or were healthier, than the potato-fed ones this season. I don't think it is safe to give sheep corn and potatoes. I have heard of many farmers in this county(Fife) who tried potatoes for their sheep this season. Several have stopped using them, owing to the loss they were meeting with; but I never heard of any bad effects from the use of potatoes where the sheep were getting a little cake at the same time Care must be taken to bring them on gradually, and give plenty of hay."

A CONSIDERATE LANDLORD.—We learn from the *Mark Lane Express* that the following curious and unintelligible notice to his tenants, has been issued by the Earl of Denbigh:—"As complaints have been made to me of the damage done by rabbits in the cultivated parts of my property and I am anxious to meet the wishes of my tenants *as far as possible*, I have arranged *with my keeper* to destroy the rabbits *as far as he can on the arable land*; and in order to ensure this being attended to satisfactorily, I have given orders that two appointed rabbit catchers shall be at the disposition of the tenants from February 15th, till the beginning of the breeding season, on the following terms:—The tenants shall have full leave to ferret all the hedge-rows adjoining arable land on their farms (excepting covert hedges) as often as they like during that period, using neither dog nor gun, but only purse nets over the burrows. All the rabbits so caught by each tenant shall be kept by him, he paying the wages of the rabbit-catcher so long as he employs him. No tenant is to ferret without being accompanyed by the rabbit-catcher. *In consideration of this concession I expect my tenants will preserve strictly for me all other game.* As frequent complaints have been made of self-hunting dogs being seen on the property, I have given orders to my keepers to destroy all such found hunting; and I request each tenant to tie or shut up any dog he may have at such times as he is not actually with his master, and to use every endeavour to prevent him from hunting when accompanying him -DENBIGH *Newnham Paddocks, April*, 1866.

THE SHELL ON THE SHORE.—We take from an English magazine this beautifully-told and instructive incident:—

"I had turned over the pebbles and the damp weeds, and sought with naked feet amongst the waves for some bright shell or coloured stone to carry home, but I could find none Tired out, I sat down on a pile of stones to rest, and to watch the waves unroll themselves on the waiting sands. I heeded not the tide, but let it go and come without notice. After a longer interval than I dare tell, considering I was without boots or stockings, and my coat damp with the spray of the last tide, I woke up from my dreaming and renewed my search for a prize, and sure enough there was a shell glistening and gleaming, coloured like sunlit crystal, just dropped from the white fingers of some daring wave. I did not hurry to possess myself of it, but sat still admiring. It was mine; I was sure I could reach it at any moment with my stick and who was near on this lonely beach to pick it up ere I could get it? Splash—splash, and up rolled a huge wave, hissing and hurrying, rattling the stones, wetting my feet—and the shell; where is it? I looked around, I followed the receding water; dripping sea grass and creamy clots of froth only remained to meet me; the shell—the beautiful shell was gone. Old Neptune had altered his mind and got back his pearl. A little loss this, but uttering a lofty lesson, never to lose an opportunity of taking every gift of mercy or usefulness the tide of time may bring us; if unused—neglected—the wave that brought will soon take it away."

The Apiary.

Improved Observatory Beehive

You say in *The Field* that it would be desirable if I would give a description of my improved observatory beehive, in which I was enabled to keep the bees uncoverd during the winter, in an open latticed arbor, the mean temperature of observation taken three times each day, being 4. 11° higher than the inside of my other hives. My hives are 12 inches long 13½ inches wide (for 9-bar frames,) and nine inches deep inside measure. If larger hives are desired, they can be made to hold 12 or 14 bar frames. The corners and frame at the top and bottom, are made of mahogany 1½ inches square, and contain four squares of glass at each side, and also the top, each square being made perfectly air-tight, with a space of one-eight of an inch betwen each glass The confined air prevents any heat escaping out of the hive, or cold getting in. During the winter months I ventilate the hive by placing a piece of fine perforated zinc over the small feeding hole at the top. The hive revolves, so that each side can be examined. I and others have seen the Ligurian queen in this hive, laying egg several times this summer. My improved bar frames are wedge-shaped, and I have found them a very great improvement in the great amount of manipulations that I have had to perform this summer. On many of the days I have had every comb out of twelve stocks, and made observations on each comb. WM. CARR, (Clayton-bridge Apiary, near Manchester.). [The observatory hives, with non-conducting sides, constructed of four parallel plates of glass, were invented by our correspondent, Mr. Tegetmeier We know that hives made upon this principle are perfectly successful in use; and we think that in mentioning their non-conducting powers some credit should have been given to the original inventor, for a slight alteration of detail scarcely warrants Mr Carr in describing them as "*my* improved observatory hives."—ED.]—*London Feild.*

Correspondence

Orchard Culture.

To the Editor of THE CANADA FARMER:

SIR,—In your issue of Jan. 15, page 28, there is an article entitled "Orchard Culture," which might be called a part of the fruit-growers' creed, each section of which might form the subject of a discourse. I shall at present only notice two of them; I have not done so before, as it were better to wait until the planting season. Whilst fully endorsing all that is said in that article, there are some of its axioms that need to be modified to become practical. In No. 8, "We believe in setting the branches low down on the trunks;" and No. 10, "We believe in cultivating orchards." Now, in orchards, properly so called—not in garden patches—it is necessary to use horses in cultivating, and to make clean work of it. When the trees are grown they must go under the branches. After a good deal of experience, I prefer horses to oxen in working among the trees. With a leather trace coming round the end of a short whipple-tree, and fastened behind, you can go very close to a tree without hurting it; whilst oxen will, upon every chance, twist their horns among the small branches, and the ends of the yoke and boughs are apt to bruise the lower limbs. Again, the branches, as the tree grows older, have always a tendency to droop, and in some kinds, as the Greening, they droop from the first, so that, in pruning, the habits of the tree must be consulted In the Baldwin, and such trees as are of a stout, upright growth, you may allow the branches to start lower down, whilst the Greening, Am. G. russet, and such as are of slighter growth or more drooping habit, you must start the lower branches higher, not less than six or seven feet from the ground. To the axioms, or articles of belief, from which I have quoted, another might be added. I believe in keeping *enough* hogs in the orchard to eat *all* the fallen apples. Now, hogs, with all their filthy habits, are nice discerners of pleasant flavours, and if your branches come to within three or four feet of the ground, they will help themselves to what they like best and leave the wormy apples, if they are hard or sour. I would like to impress upon the fruit-growers of our country the absolute necessity of removing every apple that falls prematurely or otherwise. For the last two years the apple moth has made such havoc with our fruit that I think fully one-half of our apples were stung, sadly depreciating their value, especially for exportation. Hogs are, no doubt, a sure and efficient remedy, and you can quicken their diligence by keeping them on rather short allowance for a time.

In advocating the setting of branches rather high, it is only to afford facility for clear cultivation, without which a first-class article of fruit cannot be produced. In writing, my experience is confined to the Niagara peninsula. In more northern latitudes, it may be necessary to prune lower, on account of climate. The only protection we require here is from the winds. At the height here recommended, in a full-grown tree, loaded with fruit, the branches would almost, or quite, touch the ground.

I am happy to say that up to this date we have the promise of a most abundant crop this year. Peaches may not be a full crop, but will likely be above the average. The dry season of last year caused more than an usual number of fruit-buds to set, and our trees are in a good condition to bear a full crop, from the fact that the past two seasons the crop has been very small.

It is to be hoped that when Parliament meets a protective duty will be placed on United States fruits, fruit-trees, and plants coming into Canada, equal to that which they place on ours going over there. The fruit-growers of this region are willing for free trade in this respect. We are not afraid of competition, but if we are shut out from the United States market, it is not fair that they should enjoy the privilege of ours. R. N. B.

Holemehurst, Niagara, March 22, 1866.

Application of Manure.

To the Editor of THE CANADA FARMER:

SIR,—Manure bearing the same relation to the farmer as does the raw material to the manufacturer, waiting to be converted into the several products which they are destined to become constituent parts of, it is obvious that every attention should be given anything bearing on its husbandry and application to the soil. More, perhaps, has been written upon the management of manures, (and this gives evidence of its importance,) than upon any one question connected with the cultivation of the soil; and yet probably upon no agricultural topic is there such a diversity of opinion among authorities concerning many of its details. It is the humble opinion of the writer that more light can be thrown upon the many questions in dispute relating to its management, by the publication of actual experience of observing farmers and the results of experiments, than the theories and opinions of the greatest authorities. Connected with the subject are so many details that would have an effect upon the settling of any question relating to its management, as to preclude the formation of any given rules applicable to every circumstance. Some writers will advocate some special manner of procedure relative to the subject, others will argue exactly an opposite practice; each may be right, each may be wrong—great scope must be allowed for different circumstances having dissimilar effects. And this brings us to the self-evident truth, that he who would be the most successful in the cultivation of the soil, must be not only the most conversant with the details relating to the art, but able to discriminate between these likely to have an effect favourable to his particular circumstance, and "*vice versa.*" Now there is one point connected with the subject upon which all authorities agree, but which cultivators do not seem sufficiently to understand or practice, viz: the great advantage to be derived from having all fertilizers thoroughly incorporated with the soil to which they are applied. Of the various means of having this desired object performed, none are so applicable to general use, as having the manure spread upon the surface of the land to be dissolved by the rain and melted snow, and thus thoroughly diffused through all its parts, instead of being immediately ploughed in as is the usual course.

During the cultivation of our corn crop the past season, I was particularly struck with the superior growth and luxuriance of the crop in one portion of the field. Upon that part the manure had been distributed several weeks previous to its being ploughed; on the remainder of the field the manure was ploughed in immediately upon its being spread.—That part produced 25 to 50 per cent. more than any other portion of the field, although all parts had been in every other respect similarly treated. This is one of the many instances coming under the observation of the writer which go to prove that much manure is to all purposes lost by being ploughed in, placing it beyond the reach of any influence tending to assimilate it suitable for plant food. J. F. CASS.

L'Original, April 31st. 1866.

Root Cellars.

To the Editor of THE CANADA FARMER:

SIR,—Will you, or some of your readers, give me the benefit of your experience in connection with Root Houses *above ground?*

My farm is admirably adapted for growing roots, but it is low and flat, and a root *cellar* in connection with the existing farm buildings could not be drained, if more than 2 feet deep. Accommodation for roots must therefore be provided mainly above the surface, and I am anxious to erect a substantial and thoroughly frost-proof building, without expending a dollar unnecessarily. I am sure that some of your readers have done something of this kind, while others have tried to do it and failed; and I ask you to publish this enquiry, that I, and others similarly circumstanced, may learn as much as possible from both successes and failures. Perhaps I ough. to mention that my principal difficulty relates to the walls of the building. All the Root Houses above ground with which I am acquainted have two walls 18 in., to 24 in., apart, the intermediate space being filled with earth. This plan is clumsy and expensive, and I hope to find that there is a better one. No stone wall, however thick, will keep out frost; if the two were united they would not do so; the efficacy then must be in the material with which the space between them is occupied, and I cannot help thinking that one good wall with an inside air light boarding at a little distance from it, the space between them filled with tanbark, saw dust, muck or some other non-conducting substance, would effect the desired result at a much less expenditure of money and space than would be required by the double wall plan.

Any of your readers who have had experience in this matter, will much oblige me by narrating it.

Yours, &c.,

J. A.

NEPEAN, Co Carleton, 28th May 1866.

STUMP MACHINE.—"Robert Gibson," of Glenvale, writes. "In your issue of May 15th, I find an enquiry made about a Stump Machine, by "T. B." of Sandforth I have got a Stump Machine which I can recommend to him or any farmer in Canada. This machine is a lever power worked with a handspike, and two men are able to take up any pine stump without assistance of a team or screw I have had a great many pine stumps on my farm, and I can fully recommend the machine to work better than any other that I have ever seen, both as to the power and the convenient method of moving it from one stump to the other. It is moved by means of an axletree fastened on the frame of the machine with two cart or waggon wheels, and drawn by horses or oxen and backed up to the stump. It is tipped up like a cart, and two men and one horse, or one yoke of oxen, can remove and work the machine. The maker of this machine is Joseph Connley, Yarker, Canada East, maker of last Improved Steel Plough; the price of the machine is sixty dollars. I hope that this information will be satisfactory."

The Canada Farmer.

TORONTO, UPPER CANADA, JUNE 15, 1866.

The Season.

SINCE our last issue, the weather has been in the main favourable for the farm and the garden. We have had some fine showers, accompanied by a moderate degree of warmth, and vegetation everywhere has made considerable progress. As compared with past years, however, the present season is extremely late. We had an auspicious seed-time, but the long continuance of cold weather retarded vegetable growth. Similar climatic conditions have obtained in Britain this spring. Our late agricultural exchanges, received per Cunard packet, state that the present has been the coldest spring the "old country" has experienced for over fifty years. In Britain, as well as in Canada, however, it is more than probable that the harvest, though late, will be bountiful.

In this country, if the weather has been somewhat unfavourable for the farmer, unquestionably our political condition has been much more so. The long-continued agitation and subsequent abortive action of a horde of despicable cut-throat vagabonds rendered it imperative that the Province should be kept on a war footing. Many of our most active and industrious agriculturists have thus been compelled to exchange the implements of husbandry for the weapons of war, and much productive labour is consequently lost to the country. We admire the patriotism displayed by our farmers, and we trust it will not be necessary to keep them much longer from their homes and their fields.

On Milk and its Adulteration.

Under the above title, a very valuable paper from the pen of Dr. Voelcker appears in the last number of the *Popular Science Review*, to which we are mainly indebted for the substance of this article.

Milk, it is well known, varies very much in its quality or composition from several causes. Among cows certain breeds yield milk in which butter predominates; in others, milk containing an excess of casein. Generally speaking, small races, or small individuals of the larger races, give the richest milk from the same kind and quantity of food. Where good quality is the main object, Alderneys or Guernseys are the cows that ought to be kept, for they give a richer cream than, perhaps, any others; but of course Alderneys are not the most profitable stock for cow-keepers in towns, with whom the Yorkshire cow, essentially a short horn, is the favourite breed, as it surpasses all others for the quantity of milk it yields, and readily attains to a great weight in fattening for the butcher. The milk, however, compared with that of the Alderney or Ayrshire cow, is more watery and less rich in butter.

Food, both as to quality and quantity, very materially affects the production and value of milk. In spring and the early part of summer, milk is more abundant, and yields a finer flavour of butter, than during the arid heat of summer. In this respect September and October are preferable to midsummer, particularly in a climate like Canada. A cow insufficiently fed not only produces less milk, but the quality is also inferior. Turnips impart a disagreeable flavor to milk, and when given in large quantities produce a very watery milk. Mangolds are much less objectionable, but they should always be given with a liberal allowance of good hay and pea meal. "It is not a little remarkable that in leguminous seeds, which are always rich in flesh forming matters as well as in other articles of food, a large percentage of nitrogenous or flesh-forming compounds usually is associated with a large percentage of phosphates or bone earth. There exists thus naturally an admirable provision in food, specially adapted for milk cows, or young and growing stock, to supply the animal not only with the material of which the curd of milk or the flesh of young stock consist, but likewise to supply bone materials, for which there is great demand when growing stock has to be maintained in a thriving state, or cows have to be kept in a condition in which they may be expected to yield much and good milk. Oil cake produces much and rich milk, but seriously injures its quality by giving it a bad flavour."

Bran is an excellent food for milch cows. For winter food nothing can be better than a mash made of bran and pea meal, with a moderate quantity of mangolds and good hay. Cows thus fed, with dry, clean bedding and warm byres, will yield a copious supply of rich milk during our inclement winters. Brewers' grains experience has long proved to be well suited to cows giving milk. From Dr. Voelcker's recent experiments, they possess feeding properties of a much higher order than has been usually supposed. In their wet state they hold from 75 to 77 per cent. of water, but contain a good deal of ready-made fat and flesh forming matters. When air dry, they contain from 7 to 8 per cent. of oil and fatty matter, and in round numbers 15 per cent. of nitrogenous matters, and in this state are more nutritious and more useful food for milch cows than barley meal in the same state of dryness.

The following table, the results of careful analyses illustrates the natural variations which may occur in the composition of *equally genuine milk*:—

COMPOSITION OF FOUR SAMPLES OF NEW COUNTRY MILK.

	1.	2.	3.	4.
Water,	85.20	87.40	89.95	90.70
Fatty matter (pure butter)	4.96	3.43	1.99	1.79
Caseine (curd) and a little albumen	3.66	3.12	2.94	2.81
Milk sugar	5.05	5.12	4.48	4.04
Mineral matter (ash)	1.13	.93	.64	.66
	100.00	100.00	100.00	100.00
Per centage of dry matters	14.80	12.60	10.05	9.30

"The analyses of these four samples exhibit a wide range of variations, which I found in equally pure and genuine country milk. The first analysis represents the composition of a sample unusually rich in butter; the second shows the composition of milk of average good qualities; the third of poor, and the last of very poor country milk."

The richness of the first is ascribed to the excellence of the pasture in the autumn, when milk though smaller in quantity is always richer in quality. The last sample was also September milk, and the very small amount of butter yielded is attributed to poor and scanty pasture. In the same month (September) the Doctor procured samples of milk from two of the farms, on which the cows were out in grass, having an abundant supply of grass of good quality. The morning and evening milk from each farm on analysis furnished the following results:—

	1		2	
	Morning Milk	Evening Milk	Morning Milk	Evening Milk
Water	87 07	87 20	87 50	87 70
Fatty Matter (pure butter)	5 44	5 70	5 10	3.99
*Caseine (curd) and a little albumen	3 37	3 33	3 45	3 37
Milk Sugar	3 85	3 95	3 18	4 57
Mineral Matter (ash)	.77	.71	.77	.77
	100 00	100 00	100 00	100.00
*Containing Nitrogen	.53	.54	.52	.64

"These analyses do not show any great difference, and prove that the quality of the September milk was good, and nearly the same on both farms, but compared with the September milk of No. 4 in the preceeding table, striking differences manifest themselves, indicative of the influence of food on the *quality* of milk. Thus on the farms on which the cows were provided with abundance of grass, the amount of solid matter, on an average was 12½ per cent; and in the dry matter we have 3½ per cent of pure butter, and about the same quantity of curd; whereas a scanty supply of grass produced milk containing little more than 9 per cent of solid matter, and in this only 1¾ per cent of butter.'

It will be seen that the variations in the amount of curd and milk sugar in good and watery milk are far less striking than those in the amount of butter. A very good judgment of the quality of milk may therefore be formed from the amount of butter which it yields in churning, or from the amount of cream which it throws up on standing. Instruments, adapted for measuring the *quality* of cream thrown up by different samples of milk, are called creamometers. They are simply graduated glass tubes, divided in 100 equal degrees, in which milk is poured up to the division marked 0, and kept at rest for twelve hours. Although the creamometer does not furnish results which correctly represents the real amount of butter in different samples, it nevertheless affords a ready means of ascertaining whether milk is rich or unusually poor in butter, in other words, whether or not milk has been skimmed to a considerable extent. Good milk of average quality contains from 10¼ to 11 per cent of dry matter, and about 2¾ per cent of pure fat. It yields from 9 to 10 per cent of cream Naturally poor milk contains 90 or more per cent of water, and less than 2 per cent of pure fat, and yields only 6 to 8 per cent of cream, or even less.

From experiments carefully conducted on a large scale, it appears that the thickest cream does not always yield the most butter. Cream from different kinds of milk varies very much in its composition. The creamometer, therefore, is not to be implicitly relied on when samples of milk have to be tested that were produced under very different circumstances. Milk that has been subjected to agitation by its transportation from the country to towns throws up less cream than when it is not disturbed. Dr Voelcker found by experiment that one hundred measures of new country milk, after standing for 24 hours at 62° F., gave 12 per cent. of cream by measure; whilst at the same time, a little quantity of the same, after having been greatly shaken in a bottle, threw up only 8 per cent. of cream. This perhaps, is the principal reason why milk dealers in towns give a higher price for the milk of well-fed town cows, than for that sent from the country. With reference to adulteration, the Doctor observes:

"However, London milk, as generally sold to the consumer, is usually skimmed once, and diluted with about 30 per cent. of water. A good deal has been said and written about milk adulteration. Sheep's brains, starch paste, chalk, and other white substances, which are said—on what authority nobody has ever decided—to have been found in milk, only exist in the imagination of credulous or half-informed scientific men. It is difficult to understand where all the sheep's brains should come from, and how they could be amalgamated with milk; nor is it at all likely that chalk, a substance insoluble in water, and not easily kept in suspension, should be employed for adulterating milk. As a matter *of fact*, I may state that I have examined many hundreds of samples of milk, and never found any chalk nor any adulterating material except an extra quantity of *water*; and that I never met as yet with a chemist who has found any of the clumsy adulterations which popular treatises on food describe as having been detected in London milk."

The whole question of milk adulteration and means of detecting them, resolves itself into an inquiry into the character of good, bad, and watered or skimmed milk, and the mode of recognizing them with precision.

"As the result of my own experience, founded on the examination of many samples of milk produced under the most varying circumstances, and purposely adulterated with known quantities of water, I may state that milk may be considered rich when it contains from 12 to 12½ per cent. of solid matters, 3 to 3½ per cent. of which are from fatty substances. If it contains more than 12½ per cent. of solid matter, and in this 4 per cent. or more fat, it is of extra rich quality. Such milk throws up from 11 to 12 per cent of cream in bulk on standing for 12 hours at 62° F., and has a specific gravity varying from 1.028 to 1.030."

Good milk of fair average quality, contains from 10¼ to 11 per cent of dry matter, and in this about 2¾ per cent of pure fat. It yields 9 to 10 per cent of cream, and has a specific gravity of about 1 030. Poor milk contains 90 per cent or more of water, and has a lower specific gravity than 1.027. Sweet milk yields not more than 6 to 8 per cent of cream. Skimmed milk throws up still less cream, has a bluer colour, and is more transparent, and when undiluted with water has a slightly higher specific gravity than new milk. Good skimmed milk has a specific gravity of about 1.033 and poor skimmed milk 1 028 to 1.030 Milk purposely watered yields only 5 to 6 per cent of cream, and *invariably* has a lower specific gravity than 1.025. If milk is both skimmed and watered it yields less than 4 per cent of cream, and possesses as low a specific gravity as 1.025 to 1.026.

"A great many experiments have led me to the conclusion that within certain limits the specific gravity is the most trustworthy indicator of quality, and that for all practical purposes an ordinary hydrometer float, by means of which the gravity of liquids can be ascertained with precision, and a graduated glass tube, divided into 100 equal degrees, constitutes the safest and readiest means for ascertaining the quality of milk so far as it is affected by the relative proportions of the normal milk constituents A set of such instruments or lactometers, one being a graduated glass tube for measuring the proportions of cream thrown up on standing, and the other a gravity float or hydrometer, with plain printed directions for use, can be obtained of Messrs Negretti & Zambra at the cost of a few shillings." It is further stated that in using these instruments no chemical skill is required and that their results are perfectly reliable.

Our readers will perceive from the before mentioned facts and reasonings, how important it is that dairy farmers should pay the greatest attention both to the *breeding* and *feeding* of their cows. As cheese making is already attracting increased notice, and are some localities is carried on upon a extensive scale, its profits will be found to depend in a great measure, on the attention bestowed on the improvement of our pastures, and the raising in sufficient abundance of the most suitable kinds of food for dairy cattle.

An Agricultural Museum.

WE request the earnest attention of our readers—especially such as are members of Agricultural Societies—to the importance of establishing a public agricultural museum for Upper Canada. Ample provision for this interesting object has been made by the Board of Agriculture in providing a capacious Hall, in the building erected a few years since in this city; but we regret to say that hitherto little has been accomplished in the way of procuring specimens. Circulars have been issued to the Agricultural Societies soliciting material, but with small success. A few individuals have sent some suitable specimens, and the Board have in their possession a pretty extensive collection of grains, in bottles, chiefly foreign specimens, but as yet they have obtained almost nothing of Canadian growth. It is hoped that the present appeal will be the means, ere long, of wiping away what cannot be otherwise considered than as a reproach.

A museum of this kind should contain characteristic specimens of farm produce from every county of Upper Canada, models of implements and machines from our own mechanics, or the articles themselves when not too bulky. The name and address of the maker, price, and claimed advantages should be inserted on a card and attached to each article, thus affording to the manufacturer a standing advertisement, and much useful information to the public. Specimens of grains and grasses, such as are comparatively new, or peculiarly adapted to special localities, should occupy a foremost position in a collection of this character. The specimens should be carefully pulled up by the roots a little before they become dead ripe, accompanied by about a pint of the grain. In this way visitors can form a much better idea of the growth and characteristics of the plant than from the mere inspection of the seed, or from any verbal description. In all European collections, grain is now invariably, we believe, shown in the straw, with the roots attached. Characteristic specimens of farm or garden root crops, whether new varieties, or old ones recently introduced into new districts, would be very suitable and desirable acquisitions; as would also such kinds of fruit that would keep for a few months. By such means, with brief descriptions of the soil climate, and culture, accompanying the productions, much useful and interesting information would be imparted. Collections of weeds and insects injurious to farm and garden crops, briefly and popularly described, would be very desirable, and might be the means of awakening an interest in some minds to inquire into the growth and habits of these pests, with a practical view of preventing or mitigating their ravages. Specimens of wool from the different breeds of sheep raised in this Province, and also from abroad, would be most acceptable contributions, together with flax and hemp, both in their natural and prepared states. The characteristic rocks from which our soils have been derived, limestones and other minerals possessing manurial properties, together with our ornamental and useful woods, would all add much interest and utility to an industrial museum.

As large numbers of travellers and emigrants annually pass through Toronto, a collection of industrial products of the field and of the workshop, if thoroughly carried out and adequately sustained, would be an object of much public interest, and the means of drawing attention to the resources of the country, and of imparting, in the most practical manner, much valuable information in relation thereto. Professor Buckland, we understand, has brought the claims of the museum prominently before the agricultural public in the meetings he has recently held in different parts of the country, with, we are happy to learn, a cordial promise of support. Without the co-operation of all the Agricultural Societies, and the aid of patriotic individuals, the fully carrying out of what we have now briefly sketched will be a perfect impossibility. *Every county in Upper Canada should be represented in a Provincial Museum*; and this might readily be accomplished *by each Society doing its respective part in the way of contribution.* We trust that a united effort will be commenced in earnest the present season, and that ere long the handsome and capacious Hall, now almost vacant, will be creditably filled with the best productions of our fields and workshops. Mr. H. C. Thompson, Secretary of the Board of Agriculture, will be happy to give information relative to this project, and to receive contributions.

The Cattle Plague in Ireland.

We learn with much regret from our recent British fyles, that the Rinderpest has crossed the Channel, and appeared among some prominent and valuable Irish herds. We have, however, considerable faith in the vigilant and energetic action of the Government, and the stock owning classes in the island for the prompt and effectual extermination of the plague. The "stamping out" process within infected "cordons' is in full operation. Profiting by the painful experiences of Britain, Irish breeders have not hesitated to resort at once to the only remedy for the disease yet discovered—the pole axe. We shall probably soon hear the last of Rinderpest in Ireland.

The Vine and Wine Making.

By J. M. DeCourcenay.

(*Continued from page* 143.)

Properly made wine is an ether,—and frozen wine divides itself into two parts, one part (about half) being a concentrated wine ether, and the other solid ice, composed of water of valueless acids, and inorganic salts, injurious to wine. When wine is *properly made*, it is a *compound*, and not a mixture. Water, saccharine matter, acids, and salts combine and form "wine ether," each element having ceased to retain its own distinct character—in the same manner as common salt is no longer either chlorine or sodium, or plaster Paris, sulphur or lime. Every compound is a combination of fixed proportions, in obedience to the *law of definite proportions*, and it is this very distinction that constitutes the difference between pure wine, which is a compound; and impure wine, which is a mixture, and which might as well be termed punch, or coblers, or any other term selected from the beautiful nomenclature of our waggish neighbours. Pure wine is often adulterated with sugar, water, spirits, log-wood, essences of all kinds, and alkalies of every description.—A thing is called pure wine, being a mixture of all the above mentioned materials, with the juice of some grape. Another thing is called pure wine or pure juice of the grape, made honestly but ignorantly, by pressing some imperfect grape and mixing a little brandy with the juice, without allowing it the time to make its own combinations with either skin or pulp, and which could never, therefore, become wine ether. In short, we receive from abroad all sorts of *spurious mixtures, re-mixed* here, and everybody *pretends* on this continent to make wine with grapes or gooseberries, or currants, and call their mixtures wine. Yet, strange to say, no man establishing a brewery will think of making his own beer, but will immediately obtain a practical brewer. Can it be possible that people think it less difficult to make wine? I see continually letters in the agricultural and other papers, speaking of the wines of *one* grape being superior to that of *another*, yet there is no wine made in Europe from the produce of one variety of grape, and no one variety can furnish the proper proportions absolutely necessary to the combination requisite for the production of wine ether. The great difficulty in a new country is to succeed in obtaining in a vineyard the proper combination of different varieties suitable to the climate, and capable of furnishing that combination required for the manufacture of wine ether, and at the same time obtaining an aroma and flavour so judiciously mingled as not to permit that of any *particular* grape to be distinguishable.

In my opinion a combination may be formed of the following varieties:—

1st. Clinton, which will furnish saccharine matter, tannin, and tartaric acid, and organic salts, with abundance of colouring matter; indeed all in excess except water, of which it is deficient. It furnishes a very fine "bouquet," but not equal to the

2nd. Delaware, which is also deficient in water and in tannin and colour.

3rd. The Golden Chasselas and Musk Chasselas will furnish saccharine matter and aroma, with organic salts, and ferment; and lastly—

4th. The Ontario, which, without any *foxy* or disagreeable flavour, will furnish some saccharine matter, and the *water* of which others are deficient, and which it holds in excess; and although it may be supposed that water may be easily supplied artificially, I would advise in preference, and for economy as well as for the security of supplies, obtaining it from a harmless watery grape.

Mr. Frederic Schouro, the Danish botanist, has published a very remarkable essay upon the plants of Pompeii, which has been translated into German, French, and English. I have gathered the substance of it from Blackwood, and think it most applicable to this country, where the metamorphosis of vegetation must already have become apparent to every one. We seem naturally to expect that the same class of trees and plants will grow for age after age on the same spot, but an inspection of the pictures preserved in Pompeiines, an I an examination of Virgil and other classics of that day, show that the character of plants and trees has been changed in Italy within the last 1800 years, and that they bore a far more northern aspect than at present.

The early settlers in Italy formed a forest region of common deciduous trees. The beech forest, which Schouro calls the symbol of Danish character, and the maple, which is that of Canadian, flourished formerly throughout Italy, although now driven back to the Alps and Appenines. Some trees of which Virgil celebrates the grandeur, are now impossible to discover, and the region he celebrated was not the land of the Cypress and the Myrtle, but of the Oak, the Ash, the Linden, Elm, and Beech. Trees like our own formed the forests of which he sang, and if the maple is yet discovered on the plains of Italy, it is because its affinity for the vine allows it to be used with advantages as a prop for that plant. In the course of centuries, southern vegetation seems to have crept upwards, and the characteristic plants of Italy have therefore now a far more southern appearance than they had when Virgil sang and Cicero declaimed; whilst in Greece, also, the Linden, the Yew, the Beech, the Alder, the Cornel, and the Ash have almost entirely disappeared. The productions for which Italy has since become famous, were known only to Pliny as "foreign plants." The citron was only cultivated the third year after Christ. Lemons came with the Saracens, and Oranges were brought by the Portuguese from the east, while the Aloe and Indian Fig came from America. The white or silk worm Mulberry was unknown to the Pompeiians, and only commenced to be cultivated in the sixth century, and silks were imported by the Romans from the East. Barley was cultivated for the common people, and now Rice and Indian Corn (then unknown) are the staple commodities. The same change going on there has everywhere been developed by civilized man. At first by great care and pains, southern plants have, by protection, been raised; they have by degrees become hardy, then indigenous, and thus the fruits of the South are everywhere creeping towards the North. The acclimatation of plants is becoming a science of itself, and its progress may well be illustrated by the introduction of the Olive into the Crimea. Before, however, endeavouring to introduce the more valuable Southern plants, let us succeed in developing our indigenous ones, such as the Vine, the Mulberry, the Walnut, and the Chesnut; and we require only to understand the manner of cultivating each in order to abound in the production of wine, oil, and silks, and obtain the "ready-made bread" of the Chesnut.

The difficulties to be overcome are, above all, our own prejudices, and of obtaining skilled labour, in order to set the machine in motion. Prejudice is the child of ignorance, but *no government* of civilized men is permitted in this century of advancement to plead ignorance; and the responsibility of a poor system of agriculture, far beneath the qualities of our climate, attach itself to them; for private enterprize dare not calculate beyond that which will give immediate returns: and as I have previously mentioned on more than one occasion, we have "an agricultural limit" to overcome.

How to Water Plants in Pots.

Numerous are the enquiries as to the time and frequency of supplying greenhouse and other indoor plants with water—their most important want. The curious part of the matter is that people—almost in the same words—seem to take it for granted that it should be done at stated hours and intervals, as if, in this variable climate, it was as easy a matter to cultivate tender plants in a highly artificial state as to appoint the hours for relieving a sentry guard. It is an important subject for every cultivator of tender plants, and should be understood by all such. Those who water their plants at regular intervals and give each about the same quantity of water—as is often done, even by professional gardeners who do know their business—are pretty sure to kill some of the most valuable and delicate, as in a conservatory or other house full of plants there is scarcely one but will differ from its neighbour in the amount of water it requires at this season, even if the plants are all of the same species. In a mixed collection the difference in the amount of moisture to be supplied is very considerable. Succulent plants—Aloes, Yuccas, Cacti Mesembryanths, and such fat-leaved subjects—require little or no water from the beginning of November to the end of February; at least, such is the rule among good cultivators, though we believe it is not wise to apply it rigidly to some of these plants, which are apt to shrivel and get hurt if allowed to become dusty and dry.

Geraniums, again, though they must not get quite dry, require to be kept comparatively so in winter till their flower buds are formed. We now allude to show or greenhouse geraniums. Fuchsias are usually kept quite dry during the winter. Plants in a vigorous growing state, or coming into flower, as some are at all seasons, will of course require to be well supplied with water; that is, they require to be as moist at the root as we keep growing plants in summer, only that one-third the amount of water and watering which would be required in summer will suffice to keep them so at this season. It is impossible to lay down a rule which would be of the slightest use as to the time of watering, &c.; it must be left to the cultivator's judgment. So frequent were the bad results of promiscuous and regular watering in the generality of gardens fifteen or eighteen years ago that an outcry was raised about over-watering, &c., which certainly made no inconsiderable improvement, but was also productive of much evil by making people err in the other direction—by not giving enough of water; and we certainly have seen more plants killed and injured of late years for want of water than from an excess of it. In one particular instance a splendid and very valuable collection of specimen Camellias was ruined, from being kept too dry in a very cool house, the cultivator thinking they should be kept dry because the house was colder than such usually are. The treatment might not have had a bad result with many plants, but it killed the Camellias. A healthy-growing plant in a pot, which is, as it ought to be, thoroughly well drained, cannot well have too much water when it *is* watered. Our golden rule is: *Do not water a plant till it requires it, and then give a thorough soaking.* We are now dealing chiefly with greenhouse and conservatory plants, about which most inquiries have been made; but the rule is equally good for stove and pot plants in every structure. In hot summer weather, plants should be examined every morning, and in most cases watered; and in the case of free-growing Fuchsias and other soft growing plants in the height of their bloom, it may sometimes be necessary to water well twice a day. In the dead of winter, every second day is sufficiently often to look over greenhouse plants, and then not one in ten may require watering. The waterer should begin regularly at a certain place in the house, and examine every plant. After a little practice, he can readily detect those that are dry by merely looking at the soil; but in some cases, where the specimens have been top-dressed, &c., and soil without roots in it lying on top of that full of roots, and where bad watering has been practiced, so that the earth is wet on top and dry at the bottom, it may be necessary to strike the pot with the knuckles to see if it sounds hollow, this indicating want of water; and now and then to turn a specimen out of its pot to examine the state of the roots. When a crack is seen between the soil and pot, caused by the shrinking of the soil, it is an almost invariable sign that the plant wants plenty of water.

When the operator meets with a dry plant, instead of pouring a little water on, as many do, he should fill it up quite, and if there is not a good space for water between the soil and top of rim, he should return to it and fill up again, so as to insure a thorough soaking, for a plant wet at the surface, and dry as dust down where its main roots exist, is in the worst possible condition. In fact, it is not a bad plan to make it a rule to water gross-feeding and large specimens twice when they get dry. The great harm used to be done in old times (and very often, we fear, in these advanced days) by pouring on a little sip every morning, which resulted in the pots becoming covered with green slime, and the soil often a mass of black mud. The same regular examination should occur in summer, only less care will be required, and four times the amount of water. When rapid growth begins in the first bright days of March, too, the plants must be looked over every morning, and from that time to the end of October. Some people fill the pots with too much soil, and do not leave sufficient space for a proper dose of water to be poured on; it is a very bad plan, and has caused the death of hundreds of valuable plants. As a rule, the pot should not be filled higher than within half an inch of the brim, and in the case of large pots an inch. When settled down there will then be sufficient room for water, and sufficient opportunity to give a good drink at once—not watering again till the plant really wants it. One good watering in mid-winter will often suffice a healthy specimen plant in full leaf for two or three weeks; ten weeks later it may require one every day.—*The Field.*

Cranberry Culture.

We learn from the *Country Gentleman* that the Cranberry growers on Cape Cod, have held a convention for the purpose of organizing an association for the promotion of their interests. We give the following abstract of their discussion on the occasion, relating particularly to the culture of the plant:

The President, Mr. Small of Harwich, said that he had been engaged in the cultivation of the cranberry for many years, but still he felt there were many things yet to be learned, and presumed that others present felt the same, and he hoped they would discuss the matters before them freely and socially. He was of the opinion that maple and common brush swamps were the best bottoms for cranberries, and that cedar bottom was the next. He had had no experience with sand bottom. He thought that ditches should be near together, not more than three or four rods apart.

Nathaniel Hinckley of Barnstable, said that he had several years engaged in cultivating cranberries, and was satisfied that there was a great variety of the fruit. Some would grow best on high land, some best on low, some on peat, and some on sandy bottom. He could not see any advantage from sanding, so far as his own cultivation was concerned.

Hiram Hall of Dennis, said he owned the cranberry ground, which his father occupied as such 53 years ago, and the vines bore as well now as they ever did, the fruit, perhaps, being a little smaller. When peat was three feet below the vines, the fruit grew the best. Three or four sorts of cranberries came from the place, where only one grew originally.

Mr. Stubbs of Wellfleet, said he had been unsuccessful in his cultivation, from the fact that he could not flow or drain his vines. He had three crops of vine worms in a single year, but had discovered that chickens, let loose upon a cranberry bog, would effectually destroy them. Seventy-five chickens to the acre would destroy every worm without the least injury to the vine or berry. He thought that raising chickens and cranberries should be carried on together, and then wealth would certainly follow.

Bradley Jenkins of Barnstable, said that he had cultivated the cranberry for 21 years, on Sandy Neck. He cultivated on salt marsh bottom, with sand three or four feet deep. Is not troubled with the vine worm (sometimes called the fire-worm,) but suffers some from the berry or fruit worm; can flow only by rains. Sometimes propagates by sowing seed, but generally by the sod. He procures the seed by bruising the berry in a machine, something like a bark mill, then passing the seed through a sieve to separate it from the skins, then washing in water, it being heavier than the pulp, would settle to the bottom, and be as clear as clover seed generally is. He thought that several sorts of vines would come from the seed of a single cranberry, some late and some early, some dark and some light.

Josiah Freeman of Orleans, said he could see no change in the form and quality of his fruit for upwards of 20 years. Gets about one bushel per rod on an average.

Cyrus Cahoon of Harwich, said that peat mud and loose sand were the essential elements for the growth of the berry. He wanted four inches of peat underneath three inches of sand, as the best condition to raise fruit. If the mud was deeper, he wanted a greater depth of sand. If peat is six feet deep, he wanted ten inches of sand. That he can govern the growth of vines by the depth of the sand. He did not care whether the sand was white or yellow, so long as it was loose, and free from any soil, loam or vegetable matter, and, when squeezed in the hand, would fall apart on opening it. He had flowed his vines while in bloom, but invariably every flower bud, that had expanded and turned out, would be killed, but those not turned out were not destroyed, but backened several days. He let the water off the 15th of April, and flowed occasionally afterwards. Sometimes had three bushels to the rod.

Nathaniel Robbins of Harwich, would have ditches three feet wide at the top, slanting to nothing at the bottom, in order to prevent their caving, and that the berries might grow on the slanting sides, and thus save ground.

Obed Brooks, being inquired of, stated that one year he had the vines entirely destroyed by the vine worm, and that the next year, the same vines bore a very heavy crop of fruit, without the least appearance of the worm, no measures having been taken by flowing or otherwise to destroy it.

Profitable Culture.

I READ an an article from the Boston *Advertiser*, under the caption "Profitable Cranberry Culture," in which the writer states his income at the rate of "the snug little sum of six hundred dollars per acre."

I will state my success.

1.—IN RAISING ONIONS.

I harvested, last autumn, from a small piece of ground, twenty-five bushels of well grown and thoroughly ripened onions. There had been taken from the ground, and sold only in bunches, to the amount of several dollars—the exact sum I am not able to state—from five to ten dollars I think. The whole piece measured less than seven square rods. Before I finished taking them up and throwing them into ridges, I thought I was cutting a good crop, and to satisfy myself beyond doubt, measured a square rod in a part that had been the least thinned for early market, and found the produce to be 5½ bushels, which if I figure correctly, is equal to 880 bushels per acre. These onions sold at $1 50 per bushel—most of them at the place, without further expense than measuring. Taking the measured square rod as the basis of calculation with the price received, and I find the receipts equal $1320 per acre.

2.—GOOSEBERRY CULTURE.

I am raising the Houghton Seedling gooseberry with fair results, and so far without a single failure from any cause. The only marks of mildew I have discovered were upon a few berries on the side of bushes standing near a bush of English gooseberries, which were entirely destroyed by that pest. Eight years ago I planted out in rows five feet apart, and in the row three feet apart, six square rods of land, with the above named gooseberry plants. For the three last years they have produced three and a half barrels of fruit yearly. I do not remember the price at which they sold in 1863; in 1864 some of them sold in Boston at $14 per barrel; in 1865 they averaged about $11 per barrel. Taking the two years together the price does not vary much from $12 per barrel. Taking them as a basis, we have $1124 per acre. Besides the first plantings, I have about fifty square rods in this kind of gooseberry that are begining to pay. In 1864 I received for the fruit from this latter lot $75, and 1865 $103 90, after paying freight, &c.

I have a very thrifty orchard of apple trees, planted at the same time the bushes were, on the same ground; and the trees, I can assure you, are not injured by the cultivation the bushes receive; while the bushes are to be benefited by the partial shading afforded by the trees. I intend to enlarge my gooseberry patch, and shall plant five feet apart each way, so as to work a horse and cultivate both ways between the rows. N. FOSTER.

—*Maine Farmer.*

Cultivate Flowers.

I WOULD cultivate in children a love for flowers, and give them one to tend and care for, as soon as they are capable of doing it. It is a work that tends to beget kindness and tenderness of feeling, and will lead them to seek to be good and lovely, tender and gentle in word and deed. Who would indulge in *anger* among flowers?

Every *Farmer's wife* should have a few plants, one at least, to cherish and love. It would lighten her harder labour, and relieve her greater care, and often sooth her perturbed feelings, to give it merely a look, a thought, a draught of water in its need—to watch its growth and catch the fragrance of its opening petals. Perchance I hear one say, "I have no time to spend in that way; I have to work, work, from morning till night, and go to bed with much left unfinished." Well, I know how that is, having had some experience in that line; but the worst part of the matter is, that the spirit, the temper is so worried and fretted. By all means, calm that, though no work be done for a week; attend to your flowers; they have a soothing, calming influence. Your "husband doesn't know nor care how hard you work, or how tired" you are? Well, he truely doesn't *know*—but then it is not likely he ever *will* know; and this sin of ignorance in him had better be winked at, than fretted over. Again, I say, cultivate plants and flowers; let no day pass without listening, quietly, attentively to their whispering voices, and in your silent communings with them, learn to

"Bless God for flowers,
For the bright, gentle, holy thoughts they breathe
From out their odorous beauty, like a wreath
Of sunshine to life's hours."

—FLORA, in *Rural American.*

The Common Houseleek.

I SUPPOSE it would be a rather difficult task to find a plant of its kind to surpass in beauty the common houseleek of the cottage walls. It is one of those few fortunate plants that cannot be kicked out of cultivation, for it is the favourite of the poor, and so its life is never at the hazard of fashion, and its beauty is never put to any test of comparison, for usually its owner rejoices in his possession without perplexing his mind with critical considerations. I confess that when I spend an hour in taking stock of the plants on my Roman wall, I always get bewitched with the great patches of houseleek that spread, spread, spread about on the summit, and cling fast to shelves and chinks where there is not a particle of soil, as if quietly proceeding to usurp possession of the whole as genius of the ruin which Time has *not* made. And it would be no mean feature in a garden, a good ruin completely covered with the thrifty growth of *Sempervivum tectorum*, with its imbricated crowns that look so fat and "life-long," so bronzy and hard, so quietly persistent, so like the rock itself, immoveable and unchangeable, the best emblem of eternity we can find among plants after the palm tree, which by classic prescription holds this high place exclusively. It has been my custom now for many years past to direct the attention of amateur cultivators to families and groups of plants that—as I view the case—are entitled to much more attention and admiration than they receive, because in the first place, they are beautiful and interesting, and calculated to stimulate inquiry and thought; and in the second place, because to cultivate them well does not demand much sacrifice or entail any great expense. Everyone to his taste, of course; but for myself, a score of really interesting plants would any day give me more delight than a furlong of fine colours, except in some very peculiar cases and circumstances. It may be good for trade when amateurs order in bedding plants by the thousand, and pay their tens and twenties, as many of them do, for a blaze of colour; but it is better, doubtless, for the spread of knowledge and the improvement of taste, and the furnishing of the individual mind, when individual plants are prized, grown well, watched in all their phases, and their botanical and morphological relationships made matters of study. Then it is that botony and horticulture come into the service of the muses, furnish materials for the advancement of art, and give a rosy hue to the quieter aspects of human life, for well-chosen hobbies are among the best of secular agencies for increasing the sum of human happiness.—*Hubbard's Gardeners' Magazine.*

KEW GARDENS.—Taken for all in all, Kew is *the* botanic garden of Europe, and is recognised as such by our continental friends. When these gentlemen shall have feasted their eyes upon the Great International Flower Show which we are preparing for them next month, the very next thing they will want to see will be the gardens, the houses, the museums, the herbaria of Kew. The fame of these has gone abroad; the reputation of the former as well as of the present director is as well established on the Continent as here. Not alone in Europe, but in our several colonies in every quarter of the globe, is Kew known. It is hardly possible to estimate fairly the benefits to our colonies that, directly or indirectly, have had their source from Kew. Nor can it by any means be denied that even greater results may accrue from the maintenance in a due state of efficiency of the several departments of these gardens, than any that have hitherto been arrived at. Much has been done, and still doing, but even more may be expected in the future, if no unwise parsimony or official red tapeism be allowed to hamper the proper working of this vast establishment. Well might a question be put, as it was recently, in the house of elective wisdom, as to the unfinished state of the great temperate house—the winter garden at Kew. There is the "temperate house," incomplete in itself, buried in the backwoods, from the want of proper means of access to it; set-off by workman's sheds, which, however useful, are not ornamental, and assuredly were not intended to be permanent erections in such a situation; though from the fact of the building of a bald, ugly brick engine-house within only a few yards of the building, we begin to think, after all, that the sheds we have alluded to do really constitute an integral part of the Government design. However this may be, it must be a matter of profound regret that Government should continue to delay the execution of what has been long promised, and long since sanctioned, and of what is so urgently needed —*The Gardeners' Chronicle.*

Rural Architecture.

Cheap Country School House.

The accompanying drawings form a design for a cheap country school-house to be built of timber, and in accordance with the subjoined specification. The sills of the building to rest on cedar posts sunk four feet into the ground, and to be halved and pinned at the angles. The upright posts to be 4×4, and framed into the sills and plates, and strengthened with diagonal braces when necessary The ceiling joists to be 10×2, and 16 inches from centre to centre; the upright studding to be 16inches from centre to centre. The rafters to be 2 0 from centre to centre, and notched down to, and well spiked to the plates. The roof to be boarded with 1 inch rough boards, well nailed to the rafters. The roof to be shingled with good split pine shingles laid 4½ inches to the weather, well nailed, and the ridge covered with 1 inch ridge boards and roll.

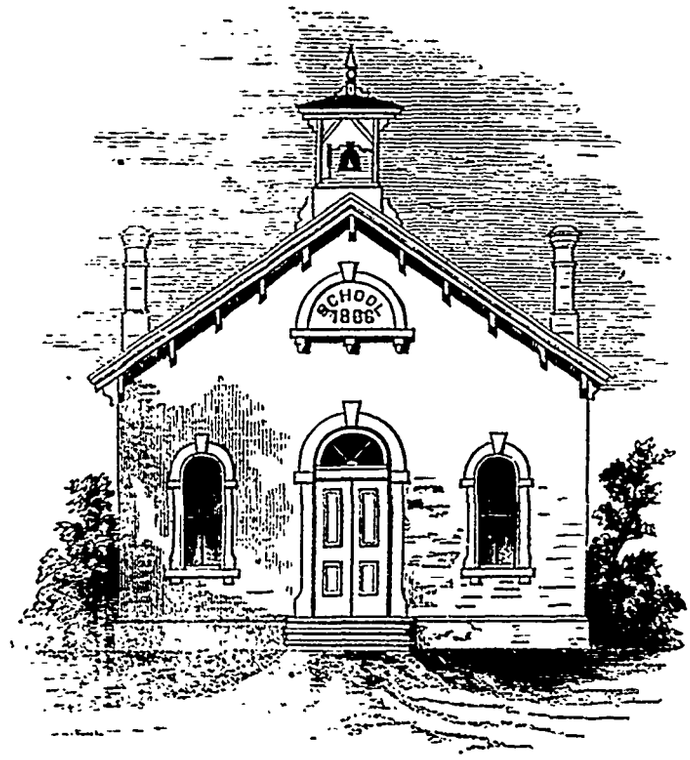
The whole of the exterior of the building to be sheeted with 1¼ inch wrought, tongued and groved sheeting, and the joints covered with ½×3 inch lathes, the whole well nailed to girths, plates and sills. A 1½ inch base board to run around the building.

The whole of the interior of the school and class rooms to be sheeted with 1¼ inch wrought and beaded sheeting, three feet high. The windows to have box frames and double hung 2 inch sashes fixed to frames with cast iron weights and pulleys.

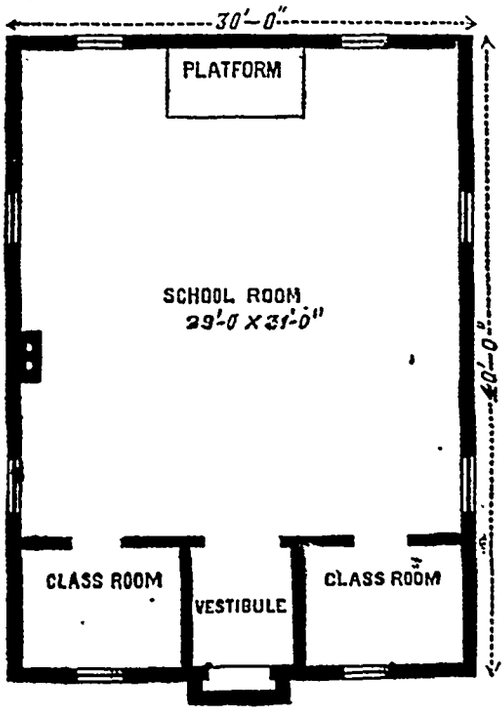
All the doors and windows to be surrounded with 6 inch single-faced architraves.

The building to be floored with 1¼ inch wrought, tongued and grooved, and edge nailed pine flooring; none of the boards to exceed 8 inches in width. All the doors to be 2 inch framed and panelled doors, and hung to frames with butt hinges and screws, and supplied with good iron rim locks. A bellfry to be fixed on the roof where shown in the plans. Steps of 2 inch rough lumber to be fixed to the front door. The whole of the interior walls, ceilings, and partitions to be plastered down to the floor with good plaster, two coats work, the plaster to be made with fresh burnt lime, and sharp clear sand. The whole of the windows and fanlight over the front door to be glazed with 16 oz. sheet glass, well bedded in good linseed oil putty, and back puttied. The whole of the exterior and interior wrought wood work to be painted with two coats of good paint composed of white lead and linseed oil. Brick chimneys to be built in the position shown on the plan, one of the flues to be used for smoke, and the other for ventilating the building. Iron rims to be built in smoke flue for stove pipe, and cleaning out flue. An iron register to be built in the ventilating flue, two feet from the ceiling, and both flues to be carried up as shown on the elevations.

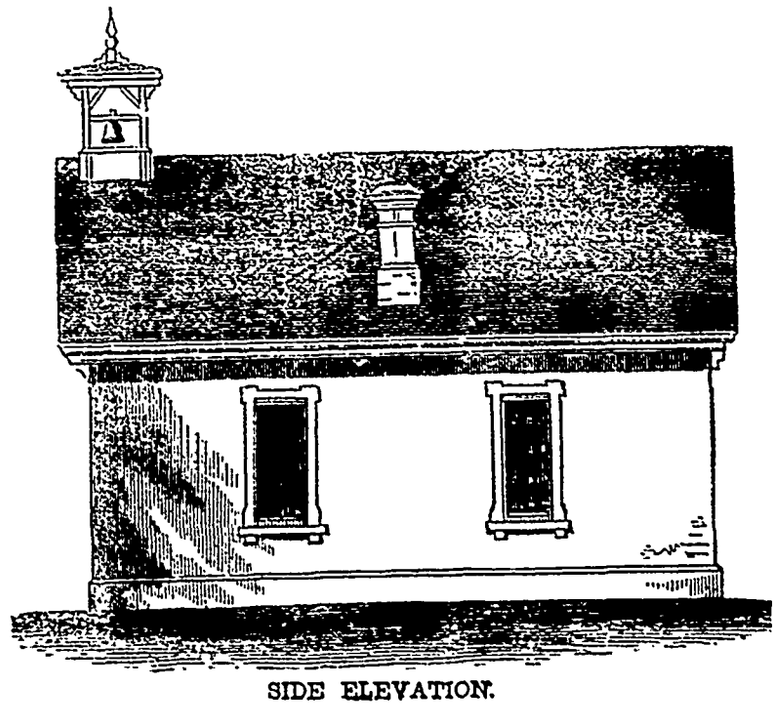
The foregoing engravings and specifications are the nearest approach we can make to a fulfilment of the request of our correspondent "Morrimac" contained in our issue of March 15th last. Prices are very high the present season, yet where material is not beyond the average, such a building might, with economical management, be put up for about the sum specified by our correspondent. Of course it could not be built so cheaply of brick, unless it were in a neighborhood where brick was plentiful, and could be had at a very low rate.



FRONT ELEVATION.



GROUND PLAN.



SIDE ELEVATION.

Wash For Roofs.—To every six quarts of quick lime add one quart of rock salt and one gallon of water. After this, boil and skim clean. To every five gallons of this, add by slow degrees, three-quarters of a pound of potash and four quarts of fine sand. Coloring matter may be added if desired. Apply with a paint or whitewash brush.—This wash looks as well as paint, and is as durable as slate.

A Cheap Ice House.—A correspondent of the American Institute Farmers' Club says:—"A year ago I had my attention called to an ice house built by a farmer near me, which was simply a bin made with rough pine boards, 16 feet square, and roofed over, leaving a large opening at the front and sides. He said his ice kept perfectly until the next winter. He put on a layer of sawdust about a foot thick on the ground and then stacked the ice snugly in the centre, 18 or 20 inches from the walls, and then filled in with sawdust, and then up over the top a foot or more thick. Last winter before filling my ice house, I determined to try this method. I accordingly tore out the inside wall, and shoveled out the sawdust, then filled by stacking it snugly in the centre 15 to 20 inches from the wall. This space I filled in with pine sawdust and covered the whole over the top a foot thick or more. I left out the window and took down my door, and left it all open, so the sun can shine in there every day. Now for results. At the present time I have an abundance of ice, and the cakes seem to come out as square and perfect as when they went in, nothing lacking except what is used out I am satisfied how to build an ice house."

Agricultural Intelligence.

Beet Root Sugar.

A CORRESPONDENT of the *Country Gentleman* states the following facts respecting the manufacture of beet root sugar in Illinois. In 1862 land was purchased, a factory built and other preparations made to manufacture the sugar, by the firm of Gennert Brothers. In the spring of '63 one hundred acres were planted. In the meantime prices of skilled labour advanced 300 per cent. The machinery was yet to be imported from Germany, with gold over two dollars. The funds of the firm were not sufficient, and, as a consequence, with meagre appliances, only 8,000 pounds of sugar were manufactured. The yield from the 100 acres of beets was ascertained to average 10 tons per acre, and the per centage of sugar was 11.4 per cent. The per centage actually obtained with the imperfect manufacture was 7 per cent.

Last September a company was formed with ample capital, and the undertaking again resumed. The Superintendent has purchased the requisite machinery and 9,000 lbs. of seed. Six hundred acres of beets will be grown the coming season. We have confidence that sugar making from the beet will prove highly successful, and if so the rich prairies of the west can supply the world.

☞ THE Merced (Cal.) *Herald* says there are thousands of bushels of acorns at the mouth of the Merced river this year. The people of that portion of the country are gathering them to fatten their hogs on. They also feed them to their horses, the animals preferring them to barley, and will fatten on them.

RABBIT MULTIPLICATION.—The *Geelong Advertiser* says that "ten couple of rabbits were introduced into the colony in 1859, and already 50,000 have been killed, Sixty-three pheasants were shot last year. The hawks prevent pheasants from multiplying; 1,200 of these pests were shot in 1865. The hares that have been introduced into the colony are breeding fast."

A NEW BAROMETER.—We learn from an exchange, that a German has recently invented a very cheap and easily made barometer Take a common glass *wide-mouthed* pickle bottle and fill it to within three inches of the mouth with water. Then take a common sweet oil flask and cleanse it thoroughly, and plunge the neck into the pickle bottle as far as it will go. This completes the barometer, and in fine weather the water will rise in the neck of the flask, descending again in wet, windy weather. Before a heavy gale of wind the water has been seen to leave the flask altogether, at least eight hours before the gale was at its height.

CROP PROSPECTS IN MARA AND RAMA.—The Treasurer of the Mara and Rama Agricultural Society writes us on this subject as follows.—"Having occasion to travel over a good part of the united townships of Mara and Rama lately in connection with business of my own, I have much pleasure to inform you that the fall wheat looks well; indeed I think better than it has for many years past. The plants are healthy and vigorous and give promises of an abundant yield should no insect pest forestall the pleasant and cheering hope now entertained. This opinson of mine is shared in by the farmers generally of this locality. Let me add that another year of good crops and good prices like the past, would do a great deal to place our agricultural population in the same prosperous condition they were in before the blighting insect marred their prospects—and absorbed their labour."

GUELPH JUNE MONTHLY FAIR.—The June Monthly Fair yesterday was largely attended by strangers from the country. As might be expected at this time of the year, and also from the exertions made by foreign and local drovers to buy up every animal that can walk on feet, the cattle on the ground, with but one or two exceptions, were of a very poor class, but realized good prices. There were only about 150 head on the ground, we quote a few sales; the average price paid for fat cattle was about 6c per lb. live weight; D. Reading sold a heifer for $50; Peter Bathgate, Eramosa, 4 head at $6.25 per 100 lbs.; John Hewer bought a steer for $45; Wm. Patterson sold a cow for $60. Thos. Laidlaw, Paisley Block, sold two to George Hood at 6 cents per lb; James Miller bought 5 from John Hobson at 5 cents, and 2 from Robert Boyd at 5½; John Cleghorn sold 2 at 5½; Mr. Swanstone sold a heifer for $62.50, a steer from Mr. Hudson, weighing 1610 lbs. for $102.25; George Hood sold 17 head to Mr. Quin, for $1000; W. Atchison sold 5 head weighing 6055 lbs., to Spiers at 6c.; milch cows were bringing from $30 to $50 according to quality and condition; Mr. George Anderson bought one for $47.50; Mr. Phin bought one at $46.50; a few sales of working oxen from $130 to $150 were effected. Walter Laing, of Nasagaweya, bought an ox last fall for $21 and sold it to day for $70 J. & W. West bought 6 from A. Quarry for $240, 1 from John Hawes for $57.50, 2 from Thos. Watters, Puslinch at $5 50 per. cwt; 8 from I. Laidlaw at $5.17 per. cwt, 17 from John Laidlaw at $6 per. cwt; 2 steers from Jas Hawes at $5.50; 2 from James Elliot, at $100, 1 from Gilbert Amos at 5c per. lb., Kenneth Mckenzie sold a steer to Geo Patterson for $73; William Benham sold 5 head at $5.50 per. cwt.; William Matthews sold a cow at $35; D. Kennedy 2 two year old heifers for $80; R. Brydon sold a cow fo, $37; John Wilson bought a cow for $47.—*Guelph Mercury.*

The Household.

Homedale Farm.

HOEING AND WEEDING.

Both vegetable and flower garden looked very smooth and nice when the seeds and plants were first put in, and the young folks flattered themselves that there would be very little trouble about taking care of them. They watched with much interest the growth of the plants and the springing up of the seeds, and found to their astonishment and dismay that for one vegetable or flower that made its appearance, ten or a dozen weeds were to be seen keeping them company In fact the beds appeared to be completely covered with green growths of one sort or other, and it promised to be a matter of some difficulty to separate the useful plants from the weeds. This condition of things very naturally formed the subject of some of those in-door talks which Mr. Perley always liked to encourage and take part in. "I do believe," said Charley, "that every inch of ground in the kitchen garden has got something growing in it, and the weeds outnumber the good plants ten or twenty to one." "The flower garden is just as bad," said Lucy. "I declare I don't see how it is ever going to be kept clean, if the weeds grow at such a rate" There is only one course to take," said Mr. Perley, "if we mean to have a good garden, and that is to destroy the weeds root and branch. I see that we are in for a stern fight all summer, but it is only what I expected. Mr. Turnberry was a slovenly farmer, and let his land get pretty well seeded down to weeds of all kinds. We shall have a hard time of it this summer, but our motto must be, '*Nil desperandum*,' never despair! If we thoroughly keep them down this season, and let none go to seed, we shall have less trouble next year, and bye and bye get rid of them altogether." "Must they all be pulled out by hand?" asked Lucy "I am afraid most of those in *your* department must missie, replied her papa, with a rather mischievous look, "but Charley will have the advantage of horse-power and implements in his department. However, your flower-beds are not very extensive, and it will only require a little patience and perseverance to conquer them" "How shall we manage in the kitchen garden?" asked Charles. "Well," said Mr. Perley, "in the first place, we can use the horse-hoe a little, though it will require a steady beast and great care. With good management, however, we can save much hand labour by passing the horse-hoe between the rows of early potatoes, corn, beans, and round the hills of squash, &c. But we can only use this implement sparingly, and our chief dependence must be on the hand cultivator and hoe. Not much will need be done by hand-pulling if these useful tools are made to do their best. The hand cultivator can be set wide or narrow to suit the rows of vegetables, and with skilful management it will run up very close to the plants. After it has passed between the rows, a very little work with the rake and hand will make a nice job of it." Accordingly the work of weeding was vigorously commenced, and in a very short time the garden looked clean again, the vegetables and flowers having sole possession. Frequent rains and warm sunshine made everything grow very fast, and soon the ground seemed as full of weeds as ever This led to more talk on the subject. "Papa," said Lucy, "the ground seems to want to bear weeds. They grow a great deal faster than good things. What is the reason of it." "Well," said Mr. Perley, "it was, you know, part of the punishment for the sin of our first parents, that the ground should bring forth the weeds, and that man should eat bread in the sweat of his face. Nothing valuable is to be got without trouble, and there is no line of business in which there are not difficulties to be surmounted, and instead of getting discontented over such things, we must learn to look upon them as useful disciples to make us patient and persevering. Besides we shall recollect that the same weather which is needed to make good and useful things grow, will also make weeds grow. The seeds of weeds being self-sown and of a hardy nature, they have many advantages over the seeds of useful plants, and are very apt to outgrow them." "How many times must the garden be hoed?" asked Charles. "That depends on circumstances," replied his papa. "Hoeing has other uses beside that of killing the weeds. If there were no weeds, the soil would still need to be stirred occasionally. The first rains of spring soften the surface, but successive rains tend to make a hard crust on the top. Sometimes the ground seems to get a kind of thick, tough skin on the top of it, and this will not let moisture and air go through properly. Two rules ought always to be observed about hoeing. *First;* Hoe whenever there are any weeds. *Secondly;* Hoe whenever the ground is hard and dry." "But won't that make a great deal of work, papa?" asked Charles. "Not so much as might seem at first thought of it," said Mr. Perley. "A soil kept properly loose and clean, does not take long to go over, especially when you have a hand cultivator to run between the rows of plants. It is neglect that makes the work hard and troublesome. If the weeds are taken in time, and looked after little and often, they can be conquered, and the ground kept in fine order. It is very nice to see a garden free from weeds, and in a good mellow state. When so kept, everything grows beautifully in it, if the soil be rich and the weather favourable." "These weeds," remarked Mrs. Perley, "teach us some important lessons. Our hearts are, like the ground we have to till, full of the seeds of evil, which seem to spring up far more readily than the seeds of goodness. We must always be on the watch against these, if we would not be bad." "Yes," added Mr. Perley, "and our garden may also teach us the importance of beginning early in life, with the fight against the evil principles that are within us. If weeds are let grow for a time, it is almost impossible to root them out. They overshadow the good plants, and take entire possession of the ground, so it is with evil in the young heart, it must be rooted out in time, lest it get completely established." "Everybody does'nt think so," said Charley, "I heard that hired man we had helping Peter, say he did'nt believe in so much trouble and fuss about training and teaching children religion, he thought they should be let alone, and left till they were old enough to understand and choose for themselves." "What did Peter say to that?" asked Mr. Perley. "O, he argued against it, and thought the man was all wrong," said Charles. "So did I, and I told him of something I read about the poet Coleridge. Some one was telling him that the best way to do with children was to let them grow up till they could think and choose for themselves. Coleridge quietly took him into his garden, and showed him a corner that was full of weeds, and said he was leaving that part without bias, and letting it choose for itself." "Very

good," said Mr. Perley. "I know what I would have said if I had heard them talking," said Lucy "What?" asked her mamma. "I would have told them about poor little Topsey," replied Lucy. "I read about her in 'Uncle Tom's Cabin' When Miss Ophelia asked her who made her, she said she did'nt know, she 'sposed' she 'just grow'd up,' like corn or cotton. What a poor, wild, ignorant, wicked little thing she was. And I suppose I would'nt be any better if I had'nt been taught." "Our garden may remind us of another thing," said Mrs. Perley. "Weeds grow naturally, and of themselves, but good and useful plants must be put into the ground and cultivated. So evil springs up without effort, but the good needs to be planted within us, and carefully cultured." "Yes," added Mr. Perley, "and we are not able of ourselves to keep our hearts clean. We are too weak and wicked for the task. Hence our need of a Saviour. We must have Almighty help to overcome evil. Christ Jesus tells us, 'Without me ye can do nothing.' True goodness is 'the planting of the Lord.' What grows naturally in us is only evil. Therefore it is that we must pray to God that he would cleanse the thoughts of our hearts by the inspiration of his Holy Spirit, that we may perfectly love Him, and worthily magnify His holy name."

(To be continued.)

Extract of Meat.

BY BARON JUSTUS VON LIEBIG.

I SEE that rather contradictory views are expressed by different English writers on the value of the extract of meat, some taking it to be a complete and compendious substitute for meat, whilst others assert that it has no nutritive value whatever. The truth, as is usually the case, lies in the middle, and as I was the first who entered more fully into the chemistry of meat, I may be allowed shortly to state the results of my investigations as far as the *extractum carnis* as nutriment is concerned.

The meat as it comes from the butcher contains two different series of compounds. The first consists of the so-called albuminous principles (i.e., fibrin and albumen) and of glue-forming membranes. Of these, fibrin and albumen have a high nutritive power, although not if taken by themselves.

The second series consists of crystallizable substances, viz., creatin, creatinin, sarcin, which are exclusively to be found in meat; farther, of non-crystallizable organic principles and of salts (phosphate and chloride of potassium).

All of these together are called the "extractives of meat." To this second series of substances beef tea owes its flavour and efficacy, the same being the case with *extractum carnis*, which is, in fact, nothing but solid beef tea—that is, beef tea from which the water has been evaporated. Besides the substances already mentioned, meat contains, as a non-essential constituent, a varying amount of fat. Now neither fibrin nor albumen are to be found in the *extractum carnis*, which bears my name, and gelatine (glue) and fat are purposely excluded from it. In the preparation of the extract, the albuminous principles are left in the residue. This residue, by the separation of all soluble principles, which are taken up in the extract, loses its nutritive power, and cannot be made an article of trade in any palatable form. Were it possible to furnish the market at a reasonable price with a preparation of meat combining in itself the albuminous together with the extractive principles, such a preparation would have to be preferred to the *extractum carnis*, for it would contain all the nutritive constituents of meat. But there is, I think, no prospect of this being realised Happily the albuminous principles wanting in the extract of meat can be replaced by identical ones derived from the vegetable kingdom at a much lower price.

Just the reverse is the case in regard to the extractive matters of meat; for (their salts excepted) it is impossible to find any substitute for them; or, on the other hand, they may be extracted from the meat and brought into the market in a palatable and durable form.

In conjunction with albuminous principles of vegetable origin they have the full nutritive effect of meat.

From the extractive matters then contained in *extractum carnis* in a concentrated form, the latter derives its value as a nutriment for the nations of Europe, provided it can be procured in large quantities, and at a cheap rate, from countries where meat has no value. The albuminous principles of vegetable origin are principally to be found in the seeds of cereals, and the European markets are sufficiently provided with them; on the other hand, the supply of fresh meat is insufficient, and this will get worse as the population increases. For an army, for example, it will not be difficult to provide and store up the necessary amount of grain or flour; sugar, too, as well as fatty substances and the like, will be procurable, their transport and preservation offering scarcely any difficulty; but there may easily occur a deficiency of fresh meat. Salted meat but inadequately replaces fresh meat, because in the process of salting a large quantity of the extractive principles of the meat are lost; besides, it is well known that those who live on salt meat for a continuance become subject to different diseases. Dried meat generally means tainted meat, scarcely eatable. *Extractum carnis* combined with vegetable albumen enables us to make up the deficiency; and that combination is the only one at our disposal. What was said of an army also holds good of those European nations in general that do not produce a sufficient quantity of meat. By making the most of the herds of South America, in using them for the preparation of *extractum carnis*, and by the importation of corn from the west of the United States and other corn-growing countries, the deficiency may be made up, although not to the full extent. For, supposing ten manufactories, producing together ten millions of pounds of extract of meat from a million oxen, or ten millions of sheep, that whole quantity would provide the population of Great Britain only with one pound yearly for every three persons, that is, one pound a day for 1,100 persons.

I have before stated, that in preparing the extract of meat, the albuminous principles remain in the residue; they are lost for the nutrition, and this certainly is a great disadvantage. It may, however, be foreseen that industrial ingenuity will take hold of this problem, and solve it, may be, by a circuitous road. For if this residue, together with the bones of the slaughtered beast, be applied to our fields as manure, the farmer will be enabled to produce a corresponding quantity of albuminous principle, and to better supply our towns with them, either in the shape of corn or of meat and milk.

Made into a marketable state, it may hereafter replace the Peruvian guano, which very soon will disappear from the market.

On the value of extract of meat as a medicinal substance it is unnecessary to say a word, it being identical with beef tea, about the usefulness and efficacy of which opinions do not differ. At the same time, I may remark that it is a mistake to think that beef tea contains any albumen—that there ought to be any gelatine or drops of fat to swim on its surface.

But beef tea does not contain any albumen, and if rightly prepared, ought to be free of gelatine (or glue,) whilst the supernatant drops of fat form a non-essential, and, for many, an unwelcome addition.

I should be glad if these lines could assist in clearing up public opinion on the value of extract of meat as a nutriment, my aim being on the one hand to reduce to their right limit hopes too sanguine, on the other to point out the true share which the extract of meat can have in the nutrition of the people of Europe. In doing this, I know full well that whatever may be said for its recommendation would be in vain, if the extract did not supply a public and general felt necessity, and if it could not stand the test of our natural instinct—a judge not to be bribed.

Munich, November, 1865.

A Cheap Smoke House.

No farmer should be without a good smoke-house, and such a one as will be fire-proof and tolerably secure from thieves. Fifty hams can be smoked at one time in a smoke-house seven by eight feet square. Mine is six by seven, and is large enough for most farmers. I first dug all the ground out below where the frost would reach, and filled it up to the surface with small stones. On this I laid my brick floor, in lime mortar. The walls are brick, eight inches thick, and seven feet high, with a door on one side two feet wide. The door should be made of wood and lined with sheet iron. For the top I put on joists, two by four set up edgewise, and eight and a half from centre to centre, covered with brick, and put on a heavy coat of mortar. I built a small chimney on the top in the centre, arching it over, and covering it with a shingle roof in the usual way. An arch should be built on the outside, with a small iron door to shut it up, similar to a stove door, with a hole from the arch through the wall of the smoke-house, and an iron grate over it. This arch is much more convenient and better to put the fire in, than to build a fire inside the smoke-house, and the chimney causes a draft through into the smoke-house. Good corn cobs or hickory wood are the best materials to make a smoke for hams. The cost of such a smoke-house as I have described is about $20.—*Ex.*

Markets.

Toronto Markets.

"CANADA FARMER" Office, Friday, June 15, 1866.

In breadstuffs the past week has been one of great dullness; business in every department has been almost at a stand-still. The Fenian invasion has monopolized general attention to the almost total exclusion of business. Many of the principal merchants and a great number of their employes are away to the front with the volunteers, and those who remained at home were too much engrossed with the exciting news of the week to attend to business In the flour market the demand during the week has been quite moderate, and the market was dull. Within the past two days prices have rather improved however, and No. 1 superfine was held to-day as high as $6 50, buyers offering $6 40. A sale of No. 2 is reported at $5 65. Fall wheat sold on the street at $1 60 to $1 80. Spring wheat from farmers' waggons, $1 35 to $1 40, and $1 30 for inferior samples. Oats in the absence of transactions is nominally quoted at from 32c. to 33c. Barley also nominal at 45c. to 55c. Eggs are quoted at 10c. to 11c. Dairy packed butter is very dull and difficult of sale at 14c. to 16c. A perfect stagnation of business has taken place in provisions, owing to the impossibility lately experienced of getting forward consignments by rail. The weather has thus far been highly propitious for the manufacturing of butter, and when the Fenian excitement has once subsided and business again actively resumed, considerable consignments may be expected and a brisk season looked for. In pork there has been almost nothing doing. Beyond a few sales for the supply of the volunteers on the frontier, and for the demand of local consumption, there have been no transactions. Wool is only sparingly offered and sells at 33c. to 35c. The clip of this year is thought to be considerable. Farmers are, however, holding back for higher prices.

Montreal Markets, June 13.—Laid'aw, Middleton & Co. report:—*Flour*—Receipts 800 barrels; market quiet; extra nominal. Welland Canal superfine, $6.45 to $6.60 Canada brands, $6.60 to $6.70; Coarse grades none; bags $3 10 to $3 70. No transactions in grain. Ashes steady. Butter dull and nominal.

Goderich Markets.—*Spring Wheat* $1 30; *Fall Wheat* $1 40 to $1 50. *Oats* 23c to 25c. *Flour*, $6 to $6 50c. *Barley* 40c to 50c. *Peas* 40c to 45c. *Sheep*, $4 to $5. *Pork*, $7 25 to $7 50 *Beef*, $8. *Hides*, green, $4 50. *Butter* 14c to 16c. *Potatoes*, 30c. *Wood* $1 75 to $2 25. *Eggs*, 8c. *Wool*, 25c. to 23c.

London Markets, June 12.—*Fall Wheat*—superior, $1 60 to $1 85. *Spring Wheat*, $1 30 to $1 40. *Barley*, 50c. *Oats*, 26c to 30c. *Peas* 55c. *Corn*, 50c. *Wool*, per lb., 33c to 36c. *Dressed Hogs*, per 100 lbs, $8 to $8 25. *Beef*, per cwt., $7 to $7 50. *Butter*—fresh, per lb., 15c to 17c; keg 14c to 15c. *Flour*, per 100 lbs, $3 50 to $4 50 *Hides*, dry, per lb., 10c; do green, 6c to 6½c. *Sheepskins*, fresh off, $1 to $1 50. *Eggs*, per dozen, 9c to 12c.

Galt Markets.—*F. W. Flour*, per 100 lbs $4 25. *Sp W Flour*, do. $3 25. *Fall Wheat*, per bush., $1 60 to $1 65. *Spring Wheat*, do., $1 30 to $1 35. *Barley*, do., 50c to 62½c. *Oats*, do., 30c to 33c. *Butter*, per lb., 12c to 15c. *Eggs*, per dozen, 10c to 11c. *Beef*, per 100 lbs., $7. *Pork*, per lb., 10c to 12½c; do. per 100 lbs., $8 to $9 00. *Cheese*, per lb., 9c to 11c. *Hides*, per 100 lbs., $5. *Calfskins*, over 8 lbs, 10c. *Sheepskins*, $1 50 to $2 00. *Pelts*, 12½c. *Lambskins*, 20c to 25. *Potatoes* 37½ to 50 c. *Wool* 33c to 35c.

Oswego Markets, June 12.—*Flour*—Market in some grades shows a partial advance of 25c to 50c per barrel; $10 25 to $10 50 for brands from No. 1 spring, $12 to $12 50 from red winter, at $15 for double extra from primo white wheat. *Grain*—Wheat scarce and quiet; mixed Milwaukee club at $2 05. Corn held at 74c for No. 1 Illinois, without sales. Oats quiet at 52c for western. Rye held at 95c for western; no sales. Barley and peas nominal. Canal freights dull and unchanged; flour 26c to 28c, wheat 9½c; corn 8c to New York. Lumber $3 to the Hudson, and $4 50 to New York.

Hamilton Markets, June 22.—*Oats*, 36c to 38c. Wool is beginning to come in more freely, and the price offered is 55c. There is very little wheat of any kind coming in. Gasin.—*Fall Wheat, white wheat*, $1 70 to $1 80. *Red Wheat*, $1 40 to $1 50. *Spring Wheat*, $1 40. *Barley*—none. *Peas*, per bushel, 60c to 65c. *Oats* 36c to 38c. *Beef*, per car-case, $8 50 to $9; inferior, $7 to $8. *Eggs*, per dozen, 13½c. *Butter*, per lb., 15c. *Hides*, per cwt., $5. *Dry Hides*, 10c per lb. *Calfskins*, per lb., 10c to 12c. *Sheepskins*, $1 to $2, according to quality. *Tallow*—W. H. Judd & Brother's prices—Rough, per lb., 6c. *Hay*, per ton, $8 to $9 50. *Straw*, per load, $2 to $3 50.

Boston Market, June 11.—*Flour*—The market is steady with a fair demand, sales western superfine at $8 75 to $9; common extra $10 to $11, medium do. $11 to $13, good and choice do. $13 25 to $19 per brl. *Grain*—Corn is firm and prices are tending upward; sales of Southern yellow at 93c to $1; Western mixed, 95 cents per bushel. *Oats* are firm; sales of Western at 60c to 70c; Northern and Canada at 75c per bushel. *Rye* is selling in small lots at $1 25 per bushel. *Shorts* are in moderate demand at $28 to $30. *Fine Feed* $31 to $32. *Middlings* $33 to $35 per ton. PROVISIONS—*Pork* is in steady demand; sales of primo at $26 to $27, mess, $31 to $32; clear, $35 to $36 per barrel, cash. *Beef* is firm; sales of Western mess and extra mess at $20 to $26 per barrel, cash. *Lard* is selling at 23c. *Hams*, 19c. to 20c. per lb., cash.

Buffalo Markets, June 12.—*Flour*—The market quiet and demand only local for dray lots. Canada sour to good $12 to $14, and fancy brands family flour, choice to very choice, $14 50 to $16. *Wheat*—The market rules quiet; only light milling demand for the better grades of spring and white and and winter and amber, No. 1 Milwaukee Spring at $2 03; white Michigan at $3; and No. 1 Milwaukee Spring at $2 03; closing quiet and some firmer after receipt of New York report, and news of advance in gold to $1 43. *Oats* opened quiet and closed firm; No. 1 Chicago at 46c., held at 47c. at close without takers; Wisconsin oats to arrive at 48c. *Barley* scarce and what there is, in few hands; held, State and Canada at $1 20 to $1 25. *Peas* dull; last sales at $1 10. *Bran* quiet and nominal at $1 25 to $1 50. *Seeds*—Clover nominal at $6, *Timothy* inactive and nominal at $5 to $5 50. Flax Seed nominal. *Provisions*—The market firm but quiet; Mess Pork 50c. better; heavy held at $31 50. *Smoked Meats*—plain Hams 19¼c.; sacked 20¼c.; sugar-cured Hams unsacked 20c., sacked 22c. to 22½c; Bacon 16c; Shoulders 14½c. *Lard* in brls at 22½c. to 23c. *Butter* dull, State 30c to 35c; Canada 25c to 30c as to quality. *Petroleum* in fair demand; refined 65c to 66c as to quality; *Naptha* 35c to 40c; *Gasoline* 30c; *Crude* 18c to 19c as to quality.

New York Markets. June 13.—*Cotton* quiet and firm at 40c to 41c for middling. *Flour*—Receipts, 10,000 bbls. Market steady for good, and dull at 10c lower for common and inferior grades; $7 60 to $8 30 for superfine State, $7 00 to $8 30 for extra State; $8 35 to $9 50 for choice do; $7 90 to $9 90 for common to medium extra Western; and $8 70 to $9 75 for common to good shipping brands extra round hoop Ohio. Canadian flour dull, and common grades 5c to 10c lower; sales, 865 bbls., at $9 75 for common, and $9 80 to $13 50 for good to choice extra. *Wheat*—Receipts 14,489 bus., market firmer for prime, and dull and declining for common at $2 24 for new No. 1 Milwaukee, $2 49 for winter red Western. *Rye* firmer at $1 24 for State and $1 26 for Canada. *Barley* dull. *Corn*—Receipts, 100,460 bushels; market 1c to 2c better at 77c to 82c for unsound new mixed Western; 83c to 84½c for sound do; 81c to 85c for old mixed western in store, and 87½c for new Western yellow. *Oats*, now dull, and 2c lower, at 61c to 66 for new Western; 65c to 67c for prime Iowa, and 80c for prime State.

Contents of this Number.

THE CANADA FARMER is printed and published on the 1st and 15th of each month, by GEORGE BROWN, Proprietor, at his Office, No. 26 and 28 King Street East, Toronto, U. C. where all communications for the paper must be addressed.

☞ Subscription Price $1 per annum, (POSTAGE FREE,) payable in advance. Bound volumes for 1864 and 1865 may be had for $1.30. Subscribers may either begin with No. 1, receiving the back Nos. for 1864 or 1865, or with the first No. for 1866. No subscriptions received for less than a year, and all commence with the first number for the respective years.

Clubs will be furnished at the following rates:—

TEN COPIES for ..... NINE DOLLARS.
TWENTY COPIES for ..... SIXTEEN DOLLARS.
FORTY COPIES for ..... THIRTY DOLLARS.
ONE HUNDRED COPIES for ..... SEVENTY DOLLARS.

To Agricultural Societies ordering more than 125 copies, the FARMER will be sent at SIXTY CENTS.

THE CANADA FARMER presents a first-class medium for Agricultural advertisements. Terms of advertising, 20 cents per line of space occupied, each insertion—one inch space being equal to 12 lines. No advertisement charged less than $2, being ten lines of space.

Communications on Agricultural subjects are invited, addressed to "*The Editor of the Canada Farmer*," and all orders for the paper are to be sent to GEORGE BROWN,
Proprietor and Publisher.