

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
- 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.
- Additional comments:/
Commentaires supplémentaires:

Continuous pagination.

- 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
- Includes supplementary material/
Comprend du matériel supplémentaire
- Only edition available/
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

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

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

THE
Canadian Agriculturist,

AND

JOURNAL OF THE BOARD OF AGRICULTURE

OF UPPER CANADA.

VOL. XII.

TORONTO, FEBRUARY 1, 1860.

No. 3.

CONCENTRATED CATTLE FOODS

In a previous number we showed from very careful analysis made by Mr. Lawes, of a prepared cattle food that has been advertised in various shapes both in Europe and America, that it cost weight for weight, four or five times as much as the most nutritive of the ordinary kinds of stock foods on our farms. We perceive from recent English journals, that several others, in addition to Thorley & Henri, have commenced manufacturing and puffing other kinds of prepared cattle food, so that the business is evidently progressing, and must of course be profitable in most instances, no doubt in an enormous degree. That most of these productions are valuable, scarcely admits of a doubt; but the question to the farmer is, whether the value put upon them by the manufacturers is not excessive. It is not necessary to consider whether an excessive profit is made in manufacturing them, but whether as compared with other substances ordinarily used for feeding stock, they are not enormously dear. These preparations are made up of a variety of different kinds of ordinary food, among which Indian Corn and bean-meal appear to be the principal, mixed

with a small quantity of some aromatic seed—such as caraway, &c.,—for the purpose of giving the mixture an attractive flavor. These foods are sold in England at from forty to fifty pounds a ton, which is within a fourth of the price of the butchers' meat, which they are intended to produce. The materials of which they are composed are not worth more than a fourth of the price charged for these kinds of preparation.

The *North British Agriculturist*, published in Edinburgh, observes: "A comparatively new trade, cattle food, has been very active since 1858. Mixtures of carob beans, bean-meal, and of the meals of cereals, with a flavoring substance, such as coriander seed, have been vended at from thirty to fifty pounds a ton, while the feeding value may be in most cases taken at something like one half that of linseed cake, or five pounds!" Prof. Cameron, of Dublin, remarks: "This so called *concentrated* cattle food is sold for forty-two pounds a ton, while in reality it is not, at the utmost, worth seven pounds!" It is far less nutritious than either linseed-cake or rape-cake, though it is no doubt more palatable to cattle than the latter."

The following testimony of a very high

authority, Dr. Voelcker, Professor of Chemistry in the Royal Agricultural College of England, is sufficient to satisfy all reasonable doubts as to the commercial value for feeding purposes of these preparations: "Most samples of cattle food which I have hitherto examined, contain large proportions of rice-meal (the refuse of rice-pressing mills,) oat-dust, and the sweepings of flour mills, mixed with spoiled and inferior flour. The bad taste and fusty smell of the latter, are concealed by strong smelling drugs, such as anise or fennel seed, and also by bitter substances, such as gentian. In one particular sample, much recommended as food for pigs, I have found the bulk of the food to consist of crushed carrots, beans, rice, and barley-meal; this food also contained some sulphur and nitre, as well as fœnugræc, and a little anise seed; it was in fact, a regular medical powder."

It is not improbable that the value of aromatic additions to cattle food may be more correctly ascertained from observing the action and results of these mixed preparations. Professor Buckman, of the Royal Agricultural College, observes:—"We happen to know that the fœnugræc seed is being used by some of the manufacturers of cattle foods, and a few pounds of these seeds ground with inferior pulse, grain, or both, impart a flavor which it would seem is highly relished by cattle; and if experience should really confirm their use, it will be no difficult matter to supply it with economy."

As one, if not more of these compound foods has been introduced into this Province, our farmers, housekeepers and others interested in stock, will do well to consider the foregoing testimonies before making any considerable purchases. The articles in question may be good condiments, or condition powders enough, and as such might, perhaps, be carefully employed, if they were less expensive. But as a substitute for ordinary food, the thing is perfectly ridiculous. If Canadian farmers turn their soil to the best account in the production

of grain, hay, flaxseed and roots, they will be abundantly able to keep in thrift and health a much larger amount of live stock, if judiciously managed, without sending to Europe for doubtful and expensive mixtures, which even there cannot be profitably employed.

OBITUARY.

With feelings of deep regret we heard of the decease of E. C. CAMPBELL, Esq., Judge of the District of Niagara. He had not enjoyed robust health for the last few years, but was enabled to pursue with slight interruptions, his usual active pursuits. His departure from among us was sudden and unexpected, and his loss will be severely felt, not only in his own immediate district, in the welfare of which he took the warmest interest, and where he was universally confided in and respected, but by a very large portion of the community at large. The judge it appears was a native of the good old town of Niagara, where he has so long and usefully resided; his father being Fort-Major of that place for many years. In the promotion of horticulture and agriculture he took the warmest interest, and not only in the town and county in which he lived, but in various other societies established in that portion of the country and also in the Provincial Exhibitions, in which he was not only a large and successful exhibitor in the horticultural department, but also a most active and zealous helper; and was often to be seen arranging with his own hands, in conjunction with others, the various articles in his own favorite department. Those who take an active part in the management of these Provincial Exhibitions will, for years to come, deeply regret his absence from among them. In his judicial capacity, as well as in private life, the deceased commanded universal confidence and respect. He had an enthusiastic love for horticulture and rural pursuits, as his extensive gardening operations, and diligence in pro-

moting agricultural societies, sufficiently attest. The judge was also President of the Upper Canada Pomological Society, and a few days previous to his decease he forwarded to the Secretary of that body a somewhat lengthened report on fruit culture; an abstract of which we hope shortly to lay before our readers.

MR. ROBT. BAKER, OF WRITTLE, ESSEX.—The last English papers bring us the information of the decease of this distinguished agriculturist, in his 66th year. Mr. Baker was not only an extensive practical farmer, but also a land valuer of large experience; and took great interest as a director both of several local societies, and the Royal Agricultural Society of England, to the pages of whose journal he contributed many valuable papers. In conjunction with the late William Shaw, he originated the London Farmers' Club, and was elected its President for two years. His papers, read at its monthly discussion meetings are among the best which that useful society has sent forth to the public. Mr. Baker did much, both by precept and example, for the advancement of the Agriculture of his native county, and his loss will be long felt by the whole agricultural community.

MR. THOS. NUTTALL.—This eminent naturalist died a few months since on his small estate, at Rainhill, England. He was born at Settle in Yorkshire, 1784, and was brought up to the business of a letter-press printer. At the early age of 22 he emigrated to the United States, and from connections which he soon formed in Philadelphia, he directed his powerful mind to those subjects in natural history, which eventually placed him in a high position as an observer and explorer of the ranks of nature, —particularly in the departments of Botany and Ornithology. He explored at different times a large portion of the North American continent, often travelling alone and exposed to the many privations and dangers incident to those early days. He was for some years Professor of Natural

History in the Harvard University, Boston; and contributed largely by his observations and writings, to the natural history of the North American continent. Mr. Nuttall contributed three additional volumes to that splendidly illustrated work on American trees, *Michaux's Sylva*, and soon afterwards, on the death of a near relative, returned to England, in 1842, where he continued most successfully to prosecute his studies and enlarge the boundaries of his favorite pursuits. His nephew was imbued with a similar spirit to himself, and had been devoting several years to the flora of the East Indies. Last Fall he sent his uncle a large case of plants, who in his anxiety to open it, unfortunately overstrained himself, and from the time of this injury he gradually declined. Mr. Nuttall was one among many instances of the successful pursuit of knowledge under difficulties; having reached a high position in science from a very humble beginning, and died as he had lived, universally beloved.

Correspondence,

LAND DRAINAGE.

AIKENSHAW, Jan. 10, 1860,

To the Editor of the Agriculturist,

Sir,—I hope you will give the accompanying communication a place in your columns. I look upon it as particularly valuable as a proof of the continued interest our esteemed friend Mr. Marks takes in the advancement of Agriculture; and as the subject of draining cannot be kept too prominently before the readers of the *Agriculturist*, it may call forth some remarks, or the results of some experiments that may be of use.

Yours obediently,

E. W. THOMSON.

JANUARY 5th, 1860.

To E. W. Thomson, Esq., President of the Board of Agriculture.

Dear Sir,—In the year '54, you may recollect, I put forth in the *Canadian Agri-*

culturist a paper on draining land, wherein it is recommended that the drains should be eight yards apart; since that time I have gathered some valuable remarks on agriculture by Mr. Mechi, of Tiptree Hall. On Draining, as follows:—Mr. Mechi says in his speech at East Essex, in Oct. '46, he lately saw a field of twenty acres perfectly drained by a single drain; it was not spring water, but a single drain took all the rain water that fell on the field. To know when every part of the field was perfectly drained, he made holes in various parts of the field and placed pipes in them to the depth of five feet and rammed earth round them, down this telescope of pipes he put a rod like a yard measure but longer, and he thus found before he cut the drain that the level of the water was within eighteen inches of the surface. Having cut a single drain through the field, he then found that the water in these trial holes began to lower more rapidly near the drain and less rapidly farther from it, but ultimately there was no water nearer the surface than the depth of his drain, four feet six inches.

The result was, that the whole field was drained by one small and inexpensive drain where others would probably have cut them 20 or 30 feet apart, and multiplied the cost tenfold. Therefore, a man before he presumed to say what drains his land required should cut his test holes, and by examining the rod, from time to time, he would see what was drained and what was not. That was important, because he had himself thrown hundreds of pounds away, and he was sure others had thousands, and he wished to prevent this in future.

Please cause this valuable information to be printed in the *Canadian Agriculturist*.

I remain, dear Sir,

Your obedient servant,

J. B. MARKS.

COUNTY & TOWNSHIP SOCIETIES.

To the Editor of the Agriculturist,

Sir,—You would oblige me and other officers connected with Township Agricultural Societies by stating in your next number what authority or power, if any, County have over Township Societies.—In perusing the statutes, others as well as myself maintain that Township Societies are a corporate body as distinct from and independent of the County Societies, as these are of the Townships; and all the connection between them being the forwarding by the County Society of a

statement of the amount of subscription, and annual report to, and conveying the Government grant from the Board of Agriculture, but having no right to dictate as to the management of their affairs, far less inflicting fines and penalties. One thing I am confident of, that Township Societies do more to promote good agriculture than the County Societies, and if the County grant were divided among the Township Societies and the County Societies done away with altogether, it would prove more beneficial to the country.

Yours, &c.,

D. ROBERTSON.

[REMARKS.—Although we cannot agree with our correspondent as to the expediency, or even admissibility, of abolishing the County Societies, we willingly insert his communication, for the sake of affording information to such societies as may not have studied the act fully in regard to the relations subsisting between the County and the Township Societies. Our correspondent is quite right in his view of the matter. Under clause 47, it is the duty of the Township Societies to send in their report of proceedings for the past year to the County Society in time to be laid before the annual meeting of the latter in the third week in January. Under clause 43, it is the duty of the County Society to receive such reports. Under clause 57, it is the duty of the County Society on or before the 1st day of May, in each year, to receive in deposit the subscriptions of the members of the Township Society for the year, and to pay the same to them along with their just apportionment of the Government grant, so soon as the County Society shall have received the latter from the Board of Agriculture. Under clause 44, it is the duty of the County Society to reply to queries from the Board of Agriculture, or the Minister of Agriculture, and as a necessary consequence to this it would, we think, follow that the Township Societies ought to afford any information the County Society might request of them, in order to be enabled to answer the queries from the Government or Board of Agriculture satis-

factorily; this point, however, is not explicitly stated in the act. Under clause 40, the president of the Township Society is *ex officio* a director of the County Society, provided that the Township Society shall have contributed ten dollars annually to the funds of the County Society. We have reason to believe that this proviso was meant to be, *either* that their should be so many members of the Township Society also members of the County Society, as that their subscriptions to the latter should amount to at least ten dollars, or that they should contribute ten dollars by vote of the Directors; and in this sense the clause has been interpreted in several instances. Further than in these points there is no connection between the County and Township Society, or dependence of the one upon the other, that we are aware of. But the full compliance with the requirements of the law on the part of the Township Societies, is the condition upon which they become entitled to a share of the public grant; and if their organization is not in accordance with the act, or if they do not send in their report, and deposit their subscriptions at the times, and in accordance with the requirements therein laid down, the County Society may refuse to apportion them any share of the public grant. But of course in case of any difficulty arising between a County and a Township Society, through inadvertance or otherwise, it is much better for both parties, if it can be done without infringement of the law, to endeavor to arrange it amicably, rather than in a spirit of litigiousness.—Eds.]

CULTIVATION OF MILLET.

St. Catharines, Jan 14th, 1860.

To THE EDITOR.

Dear Sir:—In the December number of the *Agriculturist*, I see an article by a subscriber, dated Whitby, 6th December last, on the Cultivation of Millet, and as I know you are always desirous, through your very useful Journal, to give all the information you can to the farming community. I the

more cheerfully give you my experience on the cultivation of Millet.

The first time (as far as I can recollect) I saw the cultivation of millet recommended, was in the Albany *Cultivator*, in the year 1837, page 114. Subsequently I have seen it very highly recommended in different Agricultural works. Seeing so much said in its favor, I came to the conclusion in the spring of 1857, to make a trial and test its merits. I sent to Hamilton for the seed, and sowed about a quarter of an acre, (it is believed that 8 quarts per acre is sufficient; my impression is, that it is not enough to sow broad-cast. The ground I sowed on is a heavy rich loam, having been sown with carrots for some years before, consequently all foul weeds were completely eradicated, and the ground left, as I thought, in excellent order for the reception of any crop we raise in this part of the country. I ploughed the ground early in May, as soon as it was in a fit state for ploughing, sowed the seed immediately, (broad-cast) and passed the roller over. The seed was long coming up, and when the plants made their appearance they looked sickly, and for some time grew slowly, so that the weeds got in the ascendant. However, in the course of time, the plants shot a-head, and attained to the height of three or four feet; but when the heads began to mature, the birds began to collect, and in a short time all the feathered tribe, I think, within miles, had collected on my millet ground; and as the heads matured, stripped off the grain, beginning at the top of the head, showing clearly their partiality for this kind of grain. Seeing I was not likely to save any seed, I cut the crop and bound it up in sheaves, and fed it to my stock the following winter. All kinds of cattle seemed to relish it much, and ate it with avidity; but although the ground was rich, and every attention paid to the cultivation of it, I had not a half crop, and that only fit for fodder, not having had any seed that matured.

My own impression is that millet cannot be raised in this part of the country to produce seed, on account of the depredations of birds. It was my intention at the time to make another trial—not to allow it to go to seed, but merely for the purpose of soiling, and in doing so, I had come to the conclusion of throwing up drills, say 27 inches a-part, the same as for turnips or carrots, in order that the cultivator might pass between them from time to time, as the crop required cleaning. By this mode a seed drill could pass along the drills, and the sowing would be completed. The cultivator would not only keep down the weeds,

but would facilitate the growth of the millet plant.

I have made these few remarks in the hope that more information may be elicited in the cultivation of this plant.

Many farmers have different modes of raising the same kind of crop, and when a farmer finds himself successful in the cultivation of any particular crop, it seems to me to be a duty incumbent upon him to impart all the information possible to his brother farmers, showing the kind of soil, the mode of manuring, and also the general mode of cultivation, with any other remarks that may be thought necessary. This would be of great importance to the country at large.

No doubt many farmers in the Province from long experience have attained great knowledge in raising some particular crop, when the great mass of the farming community are totally ignorant of the mode of cultivation. This should not be so. Your valuable journal is always open to receive and to promulgate all information connected with the welfare of the Province; and surely that individual who does not impart that knowledge so essential to the well being of the Province, we would naturally suppose could not have the welfare of his country at heart. A Farmer should not be kept under a bushel.

Yours, truly,

JOHN GIBSON.

[We are obliged to our respected correspondent for his communication, and heartily reciprocate the sentiments contained in the conclusion. Our pages are open to farmers generally for the interchange of thought, and to compare notes, with the results of experience. Any information or statements from practical men, in all the departments embraced by this publication, will be always welcome.—EDS.]

In the fall of the year 1857, a single grain of Australian wheat was planted in Noriega Valley, situated in the hills ten miles east of Oakland, opposite San Francisco. It was carefully cared for, and in 1858 thirteen ounces of wheat were reaped from the one grain. In 1858 these 13 ounces of seed were planted in drills, and the past summer there were reaped from them one hundred and seventy-five pounds of clean wheat, an increase in the last year of two hundred and thirty fold.

Agricultural Intelligence.

THE WIREWORM.

THE GRUB.

(Continued from Page 30.)

Although the grub, or caterpillar of the wireworm, has not been seen to come out of the egg, it has been noticed while very small. It is then like a semi-transparent short thread; but as it becomes older, its skin becomes harder and more opaque, and of a yellowish or brownish hue. It attacks the stem of a plant, just above the root, about an inch below the surface of the ground, and eats straight into the heart of the stalk.

They are frequently found eating their way upwards inside the hollow stalk of such plants as the carnation. They feed incessantly and most voraciously, stopping neither night nor day. And yet if watched they seem to get no bigger; but they do grow, and the manner of their growth is very curious.

Their skin does not grow like the skin in men, which, as we all know, becomes larger without our seeing any change taking place upon it. The human skin is gradually and imperceptibly changed and renewed,—the outer surface being worn away by degrees, and cast off and replaced by a fresh growth from beneath. So far as our eyes can tell, a man is covered with the same skin which held him when he was a baby, and it shows when he is old the mark of the cuts on his fingers which he perhaps got when he was a boy at school. It is different with caterpillars. Their skin does not grow with their growth. It is like a dress made for them; it stretches a little like any other dress, but does not increase in size. As it resembles a dress in this respect, so it does in others. Let us compare the dress of a growing boy with the skin of a caterpillar. The boy's dress gets tighter, and shabbier and shabbier, as he grows older and bigger, till at last it has to be thrown off altogether and a new one got in its place. This is what happens with the caterpillar or grub. Its skin becomes tight and shabby too, and it must get a new skin as well as the boy a new dress. So it does; but there is this great difference between the boy and the caterpillar: the boy wears no dress in his inside; but the mouth, the throat, the stomach, and intestines, as well as the very breathing vessels of the caterpillar—are all lined with skin as well

as its outside. The caterpillar, therefore, has not only to get a new skin for the outside, but also a new skin for all those parts in the inside, for there is no difference between the mode of growth of the skin inside and of that outside. Neither of them grow larger; and it will easily be understood that if the skin of the outside alone was renewed, and that of the inside left in, the caterpillar would not be much the better of the new coat to his back. The growth of all parts of the body must proceed at the same time. So the caterpillar gets rid of its skin, both outside and inside. The first symptom that it is going to do so is, that it gives over eating, and becomes restless and uneasy for a day or two. At this time portions of the skin of the inside are seen to be voided along with what it has been feeding on. How it has got these off we cannot see, but we can see how the process goes on on the outside. There must be a crack in the skin, and the old skin is ready to burst. An opening in the skin would not be of much use to it, if the skin stuck to the body as closely as ours does, or even as closely as its own skin usually does.—But a new skin has gradually grown below the old one, and is only loosely attached to it. The caterpillar then twists, and wriggles, and jumps about in the most extraordinary manner, the effect of which is, that it becomes loose. It then bends down its head to its tail, and pushes out its back till the skin begins to split, which it does longways in the middle, a little behind the head. When it has once begun to crack, it continues to puff itself out until the slit becomes large enough to allow the creature to creep out of its skin. This it does back foremost bent like a loop,—the head and tail coming out last. But there is a part from which the old skin has to be removed more inaccessible even than the intestines—namely, the air-tubes through which the insect breathes. These could not be cast off and voided like the skin of the intestines, or coughed up like something sticking in the throat; for insects do not breathe through the mouth, but through small holes which are arranged in a row (usually ten on each side) along the sides of the body,—one on each side of the ring or the segment, except the two first, of which the body is composed. From these holes fine tubes proceed, extending throughout the body, and it is through these that the insect breathes. The skin of these must come off; and if the cast skin is carefully looked at, it will be seen that they have been all drawn off like the fingers of a glove, and are still adhering like threads to the cast skin.

Immediately after the grub has come out, it increases in size with the most astonishing rapidity, so much so, that in three or four hours it has expanded to more than twice its former length and bulk. In the course of a few hours, the soft new skin has begun to harden; it then ceases to increase in size, and grows no larger till it again changes its skin some weeks or months afterwards, when the same process is again gone through.

As soon as the new skin has become hardened, the grub recommences eating with redoubled voracity, often beginning by eating up its old skin. It is supposed that the grub of the wireworm changes in skin, either three or four times, this being the most frequent number in beetles, although the number of times varies greatly in different insects, some changing as often as eight or ten times. The process is the same at each time, the grub increasing about twice its size on each change. The period which elapses between each change, varies according to circumstances. If the grub has plenty of food, and a suitable degree of heat and moisture is maintained, the changes will take place sooner, while, if these circumstances are not favourable, a long time may elapse between them; and it is a necessary consequence of this, that the duration of the life of the caterpillar varies, for its life is composed of the periods between its changes.*

*This is a very important point to be kept in view in the economy of the wireworm. It is usually said, that the duration of its life in the grub state (during which alone its ravages are to be dreaded) is five years. Now this statement entirely depends on the authority of a Swedish naturalist, named Bierkander (who kept the grubs feeding on the roots of wheat for five years, when they emerged as the perfect insect), supported by the observation of Curtis, who says that he kept some for twelve months, during which they scarcely increased in size. But it is obvious that this result is only to be depended upon, if the insects were kept in equally favourable conditions as to food, moisture, temperature, &c., as they would have had, had they been at liberty—and this could hardly be expected, few plants or animals in captivity flourishing as well as when at liberty. The proper degree of moisture is one of the things on which more depends in the rearing of insects than almost anything else; and it is obvious, that with insects living in the earth in garden-pots, it must be nearly impossible to regulate this with accuracy. The alternations between too dry and too

When the grub is full-grown, it is of a pale, ochreous colour (darker when dead), with a few hairs scattered over its polished shining skin; it is semi-cylindrical, the back being convex, the belly more flat. It is divided into thirteen rings or divisions—the first of which is the head, on it there are two little horns or antennæ on each side of the mouth, which is small, and behind them a little black speck, which might be mistaken for an eye, but which does not appear to be so, insects which live in the dark usually not being provided with eyes, at least during that portion of their lives which is spent in the dark. The first three divisions or segments after the head, have each two small legs below, making six legs in all; these legs are four-jointed. Each of the divisions, except the two first, has a small breathing hole (spiracle) in each of the front corners—the last division has two larger ones and beneath it a false leg or prehensile foot, which assists it in walking.

THE PUPA OR CHRYSALIS.

After the caterpillar has changed its skin the number of times which nature has assigned, it undergoes another change more surprising still. It leaves the roots of the plants on which it has been feeding, and descends a considerable depth into the ground. It then forms an oval cell a little larger than itself, composed entirely of the surrounding particles of soil glued together, smooth in the inside, but not lined with silk as is the case with many other insects. This cell is called the cocoon. Inside of it, it again goes through the process of casting off or creeping out of its skin, but instead of coming out of the old skin of the same shape as before, it comes out now in a totally different form. It had a mouth before, it has none now. It had legs before, (short and small though they were), these are now gone; and it has entirely the

damp must be incessant, and the growth of the grubs would necessarily be greatly retarded. Judging from the duration of the larval life in other insects, it appears more probable that its real duration in the wireworm is only two or at most three years. It is doubtful whether the grub continues to feed during the winter—some say that they have known wheat suffering from their attacks during the entire winter. This appears doubtful; for during severe frosts they descend into the soil like other grubs which live over the winter, retiring deeper as the cold increases, and remaining in a torpid state till spring returns, when they revive with an appetite proportioned to the duration of their fast.

appearance of a mummy swathed up. We can see the traces of something like parts of a beetle under the skin, as we can see something like the outlines of the limbs and head, but it is a nearly motionless, oblong form.

This state is called the chrysalis or pupa, and while in it, it eats nothing, but remains motionless in its cocoon or cell. This is the stage intermediate between the grub and the beetle, and during it some very mysterious change takes place in its structure. If it is broken open shortly after it has gone into this state, little difference will be found in its structure from that of the grub. But a little later, its tissues will be found to have melted all down into a liquid milk-like pulp, among which, doubtless, traces of the principal nerves and vessels may be found, though the mass is disorganized and structureless. If examined at a still later period, it will be found that the milky pulp assumes the form of the vessels and structure of the beetle. It is like a paper manufactory. The old rags must be reduced into a pulp, before they can be made into the new paper.*

The wireworm usually goes into the pupa state in the month of July, and remains in it two or three weeks, coming out as a beetle about the first fortnight in August. But although this is the ordinary period, it is even more liable to variation than the length of time between the changes of skin in the grub. They often passed the winter

*These facts shew that the theory entertained by the older writers, and even still held by some modern authors on the subject of the transformations of insects, is wholly erroneous. They supposed that the outer skin of the grub enclosed a succession of several skins under it each more delicate and soft, and indistinct than the one above it, but gradually like the expanding leaves of buds of plants, growing more substantial as they received more nourishment, and were more exposed to the day. In other words, they likened them to the rider in a circus who throws off one dress after another, appearing successively in a different guise—all the dresses having been ready one below the other from the first. But the laws of the development of organic structure are now better known, and from them we learn, what the pulpy state of the pupa, while preparing for its last change, might have suggested, that there is no such previous storing up or anticipatory preparation of organs or structure, but that each new change, whether a mere change of skin, or a change of form, is developed just as it is required.

in this pupa state, buried as we have described, and thus protected from the casualties and inclemency of the season. What the circumstances are which influence the duration of this state, are only imperfectly known. Where a brood of caterpillars has been hatched at the same time, fed on the same food, subjected to the same treatment, kept in the same place, and passed into the pupa state nearly at the same time, they yet differ as to the time when they become perfect insects. Most of them do so in a fortnight, others not before the same period next year, and some not before the third season; but all, whether appearing this year or next year, come out at the same period of the year. Temperature and moisture are the principal agents in this. The knowledge of this fact ought to guard us against neglecting precautions, in the belief that they are unnecessary, because the insect has apparently disappeared for some years.

(To be Continued.)

SMITHFIELD CLUB CATTLE SHOW.

This great annual exhibition of fat cattle, sheep, and pigs, agricultural implements, &c., was held in the usual place in Baker Street, during the second week of December. Upon the whole, it is not considered in the estimation of several competent judges, to have been superior, perhaps, in some respects, hardly equal to previous years. The stock was not so extremely fat as used to be the case formerly, so that their natural points were more visible, and the quality of meat better for human food. The interest usually felt in the show by the general public, does not seem to have abated. We have been disappointed of an original report; but the following from the *Times*, (our usual authority in these matters, the *Mark Lane Express*, not having come to hand) will be interesting to our readers:—

The problem how capacious a girth and how ponderous a mass of fat may be aggregated upon the limbs and ribs of an animal by dint of corn, meal, roots, oilcake, and multifarious foods is giving way to the more utile one of how much prime meat can be furnished most thriftily to the

hungry yet dainty consumers of flesh populating this kingdom of great cities. And though the microscope may spy out unhealthy tissues and membranes in the prize carcasses—though a few monstrous obesities may protrude themselves in the cattle classes, and collops of greasy bacon, more fit for the chandler and soap-boiler than for breakfast-eating epicures, may disguise the proportions of some unsavoury swine, yet the general character of this year's fat stock show is, that of well-bred animals of the most valuable description, so far developed as to prove their capability of laying on flesh in the best places, and displaying the kindly properties and fineness of bone indicative of thriving and profit. In Baker-street Bazaar, not a coarse or plain beast is to be found: and but few animals in any department of the exhibition are wanting in that refinement of form manifesting the breeder's judgment as well as the feeder's cost and care. This fact is of high importance, because such a first-class order of competing specimens tells us throughout our country the herds and flocks, here so widely and comprehensively represented, must be in an improving condition, and that the possession of the most profitable properties by their stock is an object more eagerly and extensively sought by our graziers. Pedigree in beef is a great thing, whatever it may be accounted in the generations of human kind; and a "Duchess," a "Duke of Oxford," and a "Master Butterfly," impress their special characteristics upon their progeny, so that the peculiarities of each "strain" of a particular blood are known. A great deal of the "good breeding" enters an animal by his mouth, and the show steer eats cake from his youth upward; but it is undoubtedly the judicious and long-continued improvement of the frame and proportions of animals by selection and the other arts of breeding, far more than any advance in the mode or means of feeding, that has enabled such magnificent specimens to be produced.

In glancing through the cattle classes on the present occasion, we observe that there are fewer mere butchers' animals sent to chance a fancy market in the show-yard, and thus the classes of stores and oxen are in a more forward state of farness and good feeding, and the excellence of the exhibition is still further raised by the stock of several crack local owners, who have not ventured to Baker-street before.

The gold medal in the oxen and steer classes goes to the animal that won the same distinction at Birmingham in the past

week, and the gold medal in the cow and heifer classes likewise goes to the heifer which achieved the victory at Birmingham. Mr. Shirley's steer is a surprising animal in beauty and proportions at such an age—2 years, 6 months, 27 days; his girth is 8 feet 7 inches, and the quality of his flesh is exceedingly good. Lieutenant Colonel Townley's herd may now be considered as ranking after the great herds of the Collingses, of Bates and Booth; and although his beautiful animals have entered into competition only during the last 10 or 11 years, they have won some five-and-twenty gold medals, 60 silver ones, and several thousand pounds in money prizes. The gold medal heifer of the present year, young as she is (three years and seven months) is amazingly fat, but cylindrical and marvellously well-proportioned in form; she has a remarkably handsome head, fine horns, a beautiful calm eye, light bone, and a quality of meat that was firmer and better before the incessant handling and poking of her tormenting admirers began at Birmingham show. But her most remarkable merit is that she not only possesses nearly every point in rarest measure, so that it is remarked "a pound more flesh on each side would make her perfect;" but all tendency to a narrow chine—the characteristic defect of the short-horn breeds—is lost in an unparalleled out-springing and spreading of chine, shoulder and rib; her girth attaining to no less than 9 feet 1 inch, while the breadth of her chest, giving that expansion and capacity of lung showing strength of constitution, is really extraordinary, her fore legs being just 1 foot 5 inches apart. Why, the great Durham ox, the wonder of half a century back, and one of the grandest presents ever bequeathed by dame nature to her agricultural devotees, measured at 6 years old only 17 inches between his fore legs, while his mighty girth stretched to a compass of but 11 feet and an inch; and of late years only one or two of the noblest oxen—and we believe, not any of the fat cows even of the largest frame—have equalled this pretty damsel of a heifer in the length of her girdle. There is no foundation for the suspicion that she may possibly imitate her celebrated relative of two years ago, by going home from a fat stock exhibition, and living to produce a calf.

His Royal Highness the Prince Consort, who paid a long visit to the Bazaar in the afternoon, and expressed to Mr. Brandreth Gibbs, his high satisfaction at the excellent character of this year's show, has entered

the lists rather strongly both with horned cattle and pigs. His beautiful Devon steer bred by himself, and which took the first prize in his class at Birmingham, takes the second prize in his class at Baker-street, being fairly beaten by Mr. Farquarson's large and exceedingly handsome steer.—His Royal Highness exhibits a very superior steer in class 1., and is again competing in the Hereford oxen class, but is met by one of the first animals in the show, belonging to Mr. Heath, truly a prize animal of great depth of frame. In the short-horn heifer class, His Royal Highness shows a very handsome and well proportioned heifer, which was again beaten by the splendid heifer already named, of the unconquerable Col. Towneley. His Royal Highness also contributes a Hereford ox to the extra stock classes, to which it does great credit.

Here is Mr. Stratton again winning a prize in the cow class—another of our most eminent short horn breeders, whose celebrated herd, it is said, was produced mainly from a Warwickshire cow, with 10 proofs of good pedigree except her own personal attractions. The Broad Hinton pastures have sent out animals of that wonderfully straight, rectangular, and handsome form for which the breed is noted, which have taken nearly 500 local and other prizes, amounting to between £3,000 and £4,000, beside seven gold and 15 silver medals.

The cattle classes are not, as a whole, superior to those of former years. The Devons show in considerable numbers, and constitute a good show of the breed. The Herefords are exceedingly good, and some specimens deserve especial notice—Mr. Shirley's steer, Mr. Heath's ox, Lady Foley's and Mr. Naylor's cows—these cows standing respectively as they did at Birmingham, Mr. Naylor's taking first prize and Lady Foley's second prize. The short-horn classes are well filled, and in exceeding good character; Colonel Towneley's cow transcending all her predecessors. The Marquis of Exeter's ox is a fine specimen of the breed; indeed, many fine animals are exhibited in these classes. The Sussex, Norfolk, and long-horned breeds were not very attractive, but the Scots, with their dun and shaggy coats and extended up-turned horns, obtained great notice. The polled breeds are good. There are some excellent Welsh cattle and heifers, and the cross and mixed breeds show well. The extra cattle class is commendable.

"Sheep," says old Fitzherbert, "is the most profitablest catell a man can have;"

and to this day the farmer gains more by the flock that yields him fleece and flesh than from the heavy ox or gormandizing swine. Such have been the refinements, however, upon the original breeds, that pure-bred sheep, while indispensable for maintaining a true stock, are no longer considered the most profitable for grazing. The delicate and comely Down is not altogether the most prolific of meat and wool, and the rage is now evidently for a more business like sheep—a cross-bred carrying mutton of all the delicacy of flavour and tenderness of fibre of the Southdown upon the robust and noble frame of a Cotswold, and clothed with wool not deteriorated in fineness of staple, though lengthened and augmented in weight by the Leicester and improved Lincoln breeds.

The Downs cannot well be more beautiful or appear in better character than they do on the present occasion; but they are certainly eclipsed by the immense size and ponderous proportions of the cross breeds. The Leicesters and Long-wools show well, and the former in singular variety; there are a few splendid specimens of the breed. Wool, however—such an important part of the animal—is of less account here than at a summer show of breeding stock. It still remains true that short-wool sheep may be carved into a perfectly symmetrical contour by the aid of the shears, and judges are beginning to expose and denounce particular pens for this unfairness.

The pig—that greedy devourer, yet useful scavenger and saveall—is so happily constituted that, notwithstanding the opprobrium of his manner of life, when once slaughtered we find “all of him is nice;” and economic still, if he cannot be all smoked hams or bath chaps, pickled pork or cured bacon, yet he gives even his offal parts to make the dainty pie and sausage, and to be fashioned into innumerable homely luxuries. But what our cooks would do with the extraordinary lumps of porcine matter exhibited here in such abundance we cannot divine. His Royal Highness the Prince Consort takes the first prize in one class. The three animals exhibited are all very much alike, and we imagine they constitute as admirable specimens of the race as can be found; they are of the kind called the small breed. The show of pigs is a full one; it is remarkably good, and, as usual, attracts great attention.

Although the club limits its attention to the development of fat stock and the encouraging of improved breeds, it has long recognized the value of a collection of agricultural machinery in the galleries appro-

priated as a mart for manufactures. And such is the interest taken by the public in this department, and the large amount of business transacted by all our chief implement makers and seedsmen at the annual metropolitan gathering of agriculturists, that we must add a few remarks on the principal features of the implement show, though, of course, in a hurried march through the innumerable stands and stalls, with their articles packed and piled one above another, it is impossible to see a tenth of the novelties really present, as the crowds of visitors and intending purchasers will find to their inconvenience during the week.

The most momentous question of farm mechanics, that of steam power husbandry, is represented by the invention of Mr. Halkett, who proposes to lay permanent rails across our fields at a vast outlay, in order to cheapen and facilitate all processes of tillage; Mr. Smith who adheres to his cheapest and simplest form of apparatus; and Mr. Fowler, who is now supplying the neatest, lightest, and completest machine for steam-ploughing and scarifying, after serving a long and costly apprenticeship in his endeavor to get the greatest “duty” out of the motive power, to employ a minimum length of rope, and work with the least amount of labour and expense. During the year, especially since the Warwick meeting, the subject has grown rapidly, and after years of quiet experiment and public racing trials, a great many practical testings have been made of steam culture in the regular routine of farm management; the inventors being now prepared, we understand, with testimonials so numerous, comprehensive, and convincing, that their publication will completely surprize the agricultural world. Numbers of sets of the Woolston apparatus and of Mr. Fowler’s have been supplied to English farmers, colonial and foreign planters, and others.—Some of the machines have been in use for four years; scores of farmers have started them in the hands of their common labourers; many adopters of the system have cultivated a thousand acres each—one as much as 1200 acres. The work done has included ploughing, subsoiling, deep trench ploughing, “smashing-up” of hard toul stubbles, and stirring soil that has been previously tilled; and these operations have been performed upon all descriptions of soil in all possible conditions and circumstances. Thus the fullest data will be forthcoming as to the cost of working, durability of the mechanism, liability to damage, and so on. The experience of the many uses

of the steam cultivator is entirely in favour of the new power; and extended practice has demonstrated that the expense of steam ploughing and grubbing is still lower than the estimate formed from the shorter trials. Heavy clay land can be ploughed by steam with a saving of one-third to one-half the cost by horses, and lighter soils with a saving of one-fourth. A valuable paper in the *Royal Agricultural Society's Journal* has lately shown from elaborate statistics what the average expense of farm-horse labor really is—an item hitherto extremely variable in different localities, and under different managers: and hence we can now take the comparison between the steam engine and the draught animal in definite quantities, and the superior economy of the one can be expressed in money value. But apart from the pecuniary saving—varying much, of course, with the particular form of apparatus you may adopt—the merit of steam tillage comes out in the testimonials alluded to in a much more important form. Not only is the wear and tear of a steel wire rope (that much feared item) found so inconsiderable that a thousand acres, it is alleged, have been broken up without damaging the rope—the rate of deterioration depending much upon the quality of the metal of which the rope is made, the care in working, and the stoniness of the land; but advantages are found that out-balance considerations of expense. Farmers state that they are more independent of unfavorable weather; their wheat seeding was completed a full month earlier, and their spring corn stubble grubbed up and cleaned far faster than before: additional crops have been interloped in the rotation, without risk of getting a farm full of weeds; and what is more important than all this put together, their wheat stubble for fallow has been tilled in the hot autumnal season, and so much of the long rignarole of Spring ploughings and scullings anticipated and prevented as will repay three times the cost of the steam work and give a clearer fallow and a forwarder root crop—worth anything in the present ticklish state of our turnips.

The reaping machines exhibited include the Hesse "Champion," Crosskill's improved side delivery "Bell," Samuelson's "Britannia" self-raising-off reaper, Burgess & Key's reaper with screw platform, and their new platform, and their new hay mowing machine. It is supposed that no less than 4,000 reaping machines were engaged in cutting our last harvest, their value being now fully appreciated in all our chief corn-growing districts.

Among the ploughs—in manufacturing the various parts of which the most ingenious and improved mechanical means are applied to working in wrought and cast iron, as at Belford and Ipswich—we have Messrs. Howard's, Messrs. Ransome & Sim's &c., and the notable new implement of Messrs. Hornsby, which, by its unexpected triumph at Warwick, has made as much ferment among the agricultural public as that once exhibited by the sudden appearance and conquest of Messrs. Tuxford's engine at Carlisle.

Portable steam engines are exhibited by Messrs. Tuxford, Clayton & Shuttleworth, Ransome & Sims, Smith & Ashby, and others; and threshing-machines by Messrs. Hornsby, Humphries, Garrett, &c. The stands—which owing to the demand for space, are limited to two lineal feet each, letting in the aggregate for some £700—comprize the usual immense variety of drills, chaff-cutters, mills, screens, haymakers, carts, crushers, pulpers, pumps, cultivators, and the beautiful collection of cereal specimens, seed samples, and wonderful roots on the stalls of Messrs. Lawson, Gibbs, Sutton, Skirving, and others. One principal novelty is a Canadian revolving harrow, said to be specially effective.

Horticultural.

TROUBLES IN THE FRUIT GARDEN.

No. 2.

Raising grapes by horse power! Why not? In these days when manual labor is in every department discarded as much as possible, and the power of the animal or the engine is substituted for that of man; when almost every operation of Agriculture is, or will be, performed by forces of far greater energy than the unaided hands of man can exert, why should the process of the gardener be shut out from the employment of agencies so potent. Some such idea seems to have seized upon the mind of a noted English grower of grapes, and to have led him to send into the world a volume in which he strongly argues in favor of horse power. This volume fell into my hands about the time when I was pondering the ways and means of obtaining a large supply of this universally favoured fruit. But reader, do not be puzzled. You are wondering how horse-power can be made available for so good a purpose—can be applied to such a use. You are thinking perhaps of speedily drawing the stem in

some way to a desirable length. Whipple-trees and log chains fill your eye—but discard them. There is no drawing, it is all forcing. Nor is it done by the animal while yet in possession of his natural vigor and faculties, but when these have all departed. You will think that I am speaking in a riddle. Let us look then at what the grape requires. Long, long ago old Virgil sang—

*A fine loose earth is what the vines demand,
When wind and frost have help'd the laborer's hand,
And sturdy peasants deep have stirr'd the land."*

And still the doctrine holds good. It is ever in this year of grace 1860, *sound and true, and necessary* doctrine, that the soil in which you can grow good and abundant crops of grapes *must be loose, dry and friable*. It is true that vines grow in swamps, and often most luxuriantly, and sometimes, though not often, bear profusely. But these are in a state of nature, and their fruits also, sour and crabbed enough. But those we would have are no longer so. These have been brought out, and by constant and careful cultivation have become sweet, luscious and tender, and to preserve them so they must receive the same unremitting care and attentions, and be ensured and encircled with the same conditions. So we say, first and foremost, the soil must not be compact, heavy nor water soaked. But something more is requisite. The same old author adds:—

*"Next, when you layers in your vineyard make,
Mix some rich dung, and shells and pebbles break,
Spread the good soil with liberal hand around
And trench them deeply in the lightened ground;
Superfluous moisture thus glides thro' the earth,
And healthy vapors aid the tender birth."*

A knowing hand was this old fellow. No modern discovery is at variance with his maxims—on the contrary, they are confirmed by the experience of the most intelligent cultivators. Your soil, then, must be rich, as well as friable. It must be dunged as well as freed from standing water. But the best way to obtain this richness of earth,—that is the question. That was it which troubled the mind of the author of "The Culture of the Vine under Glass," by J. Roberts, and the result of his cogitations was, that he struck out a new method. What this method was, I can best tell you by detailing my own proceedings, since I followed his directions very closely.

But let me pause a moment to say that experience is a pretty stern teacher in grape-growing, as in everything else. She may be, and doubtless is, a very wise, and able and good one, but she is sternly and terrible rough in her handling. That you,

reader, may be saved the pain of becoming her trembling pupil, I have taken pen in hand, and now to the process. Having selected a well sheltered spot, some 60 by 18 feet, it was dug perhaps 30 inches deep.—At the bottom were laid one hundred and twenty bushels of bones, to obtain which the boys with laudable zeal, scoured two townships. On these were placed several horses, and to keep them company a prize bull and a span of oxen. On these again were deposited road scrapings, sand and black mould, fourteen inches in depth. This having been levelled all was ready for planting. Such was Mr. Robert's prescription. The vines were obtained. Black Hamburgs, Black St. Peters, Zingindal, Royal Muscadine, Golden Chasselas, Pitmaston, White Cluster, Marcree's Early White, Red Frontignac and Tokay. They grew the first season marvellously. By the autumn the canes were long and stout and bid fair to bear all that it was prudent to permit them to do. The following season they were lifted, washed, carefully and constantly pruned, thinned and trained. They bore abundantly; many beautiful bunches, beautiful for size and color, rewarded the expenditure of toil and expense. But the next season, the third, in which I looked for a large and remunerating crop, what came then? Then when the roots had fairly reached the sodden mass, and their tender extremities were scorched and burnt, then mildew overspread them all. There was no exception; Isabellas and Catawbas, and the little hardy black cluster, which were treated in the same manner, one and all, presented a mass of blackened foliage and mildewed fruit. This was raising grapes by horse power with a vengeance. I know better now. No fresh horse goes into my border now to force an unnatural growth, and then to burn the delicate fibres just as they stretch out to seize the proffered nourishment. Not that the possession of one or many such carcasses is not desirable, but before applying them, they should be covered with mould and suffered to decay; such mould will, indeed, be rich, and if applied to the plant in small quantities at a time, will nourish it and cherish it to its heart's content. I tell you all this dear reader in confidence. I have never told it before. I cannot now wonder at the wry faces of those who beheld my preparations, nor at their solemn asseverations, that they would never eat grapes raised by such a method. Alas they never had the chance.

Mildewed vines and fruit are a source of

some trouble and disappointment to many. Nor is it easy always to account for its appearance? A friend of mine for years had gathered abundant crops of the sweet-water, when it suddenly mildewed and became worthless. Downing, than whom, few are better or safer guides in horticulture, speaking of this disease attacking the foreign vines, grown out of doors,—but you, reader, ask in amazement, where in the world should they be grown if not out of doors? Why in doors to be sure. Never, unless you have a very sheltered spot, try to grow the foreign vines in the open air. But if you have such a spot, do not waste your strength upon the Sweet-water, when you can so easily obtain the equally hard and very far superior Royal Muscadine. But Downing says: “That an intelligent cultivator, living in a warm and genial corner of Canada West, had been more than usually successful for several seasons in maturing several varieties of foreign grapes in the open air. At length they began to fail, even upon the young vines, and the mildew made its appearance to render nearly the whole crop worthless. Last season this gentleman gave one of his grape borders a *heavy dressing of wood ashes*, and he had the satisfaction of raising a crop of fair and excellent grapes.” So we say, look to your soil, that it be dry, deeply dug, loose and rich, and that there be wanting neither lime nor potash in the soil; for these are so necessary to the grape.

Yours,

CLERICS.

P. S.—It is not difficult to understand why the condition of solid masses of decayed matter, such as that produced by the carcasses, would be very injurious. The manure would be too sharp, too pungent. Guano applied in small quantities it is well known is highly nutritious, but what roots could live in it in a pure state. You might as well expect them to grow in a vial of strong hartshorn. There is a fault into which amateur and novices in gardening sometimes fall. Because a little of a thing is good, they imagine a great deal must be better. But it is a great mistake. Prudence in the application of manures, cannot be dispensed with, if a firm vigorous growth is to be ensured. No doubt some soils will stand, and perhaps require what would be an overdose to others. I am not sure that an underlayer of fresh carcasses would not be beneficial to a heavy clay soil in an eminent degree, while in a light soil they would burn and destroy. This is a question upon which the Editor can, no doubt, throw much light, and it is an important one.

HORTICULTURAL HINTS AND MEMORANDA FOR FEBRUARY.

“WINTER'S still here, with purpled nose and hands,
And shakes his flaky locks, and snows his lands,
How bright at morn, when nightly drizzlings freeze,
The fairy paradise of glassy trees,
Prismatic beam and crackle in the breeze.”

Cold, stern winter still holds his frigid grasp, and little more can be done in this climate than what was noticed last month. Preparations, however, should be well considered, and decided on, with reference to the coming activity of spring. Much may be done by way of providing manure for a garden previous to the advent of spring, by collecting leaves, the scourings of ditches, and other materials of a vegetable or animal nature that are to be found, more or less, around the homestead, and which are commonly suffered to run to waste, including the refuse and liquid portions of dung heaps, stables, &c. Upon light soils manure made from cows is better than that of horses, as it tends to consolidate and stiffen soils that are loose and dry; whereas horse manure warms and opens such as are cold and heavy. A due mixture, however, of animal manures, with leaf mould, plaster, wood ashes, lime, &c., is generally more efficacious than such as have only a few ingredients; and by a little forethought and attention, much may be done in this way at a comparatively little cost.

As the raising of a few early vegetables, salads, &c., in our cold, late springs, furnishes the table with what are felt at such a time, to be real luxuries, we would recommend such of our readers as possess ordinary conveniences to set about the formation of a hot bed. By a small outlay, with attention and perseverance, a sufficient amount of these things may be raised to meet the wants of a family. The following directions from the pen of Mrs. Loudon, will be found quite practicable in this country:—

FORMATION OF HOT-BEDS. — Though nearly all the kinds of manure which have been enumerated may be used occasionally for hot-beds, the only materials in common use in gardens are stable manure, dead leaves, and tan. The first of these, which

is by far the most general, consists partly of horse-dung, and partly of what gardeners call long litter, that is, straw moistened and discoloured, but not decayed. The manure is generally in this state when it is purchased, or taken from the stable, for the purpose of making a hot-bed.

The necessary quantity of manure is procured, at the rate of one cart load, or from twelve to fifteen large wheel-barrowfuls, to every light, (as the gardeners call the sashes of the frames,) each light being about three feet wide; and this manure is laid in a heap to ferment. In about a week the manure should be turned over with a dung-fork, and well shaken together; this operation being repeated two or three, or more times, at intervals of two or three days, till the whole mass is become of one colour, and the straws are sufficiently decomposed to be torn to pieces with the fork.

The size of the hot-bed must depend principally on the size of the frame which is to cover it; observing that the bed must be from six inches to a foot wider than the frame every way. The manure must then be spread in layers, each layer being beaten down with the back of the fork, till the bed is about three feet and a half high. The surface of the ground on which the hot-bed is built, is generally raised about six inches above the general surface of the garden; and it is advisable to lay some earth round the bottom of the bed, nearly a foot wide, that it may receive the juices of the manure that will drain from the bed. As soon as the bed is made, the frame is put on and the sashes kept quite close, till a steam appears upon the glass, when the bed is considered in a fit state to be covered three or four inches deep with mould; observing, if the bed has settled unequally, to level the surface of the manure before covering it with earth. The seeds to be raised may either be sown in this earth, or in pots to be plunged in it.

The proper average heat for a hot-bed intended to raise flower seeds, or to grow cucumbers, is 60°: but melons require a heat of 65° to grow in, and 75° to ripen their fruit. This heat should be taken in a morning, and does not include that of the sun in the middle of the day. When the heat of the bed becomes so great as to be in danger of injuring the plants, the obvious remedy is to give air by raising the glasses; and if this be not sufficient, the general heat of the bed must be lowered by making excavations in the dung from the sides, so as to reach nearly to the middle of the bed, and filling up these excavations with cold

dung which has already undergone fermentation, or with leaves, turf, or any other similar material which will receive heat, but not increase it. When the heat of the bed falls down to 48° or lower, it should be raised, by applying on the outside fresh coatings of dung, grass, or leaves, which are called linings.

When hot-beds are made of spent tanner's bark or decayed leaves, a kind of box or pit must be formed of bricks or boards, or even of layers of turf, or clay, and the tan or leaves filled in so as to make a bed. Where neatness is an object, this kind of bed is preferable to any other: but a common hot-bed of stable manure may be made to look neat by thatching the outside with straw, or covering it with bast mats, pegged down to keep them close to the bed.

The culture of *Mushrooms* for early use, the making of catsup, &c., is beginning to attract attention in this country, and the product is regarded by many as a great delicacy. Such of our readers as may be desirous of attempting the raising of this production, will find the following directions of service, taken from *Buis's Family Gardener*. It will readily be observed that some of the remarks on the winter cultivation are not quite applicable to this climate. Mushroom spawn can be purchased at most seed stores in our principal towns.

CULTURE.—Of late years, the cultivation of this luxury has become so simplified, that it is in the power of every farmer and cottager to grow the article for use or sale. Any time in October or November, collect from the stable daily the fresh droppings, throw them into a heap, which prevent from heating violently, by frequent turnings, and spreading it out thinly, defending it from rain or water of any kind. When the quantity of one, two, or three loads (according to resources) has accumulated, and has lain in a heap two or three weeks, (which time it will most likely require for all the parts to get into an equal fermentation), as soon as it is observed that the fiery heat and rank steam of the dung are gone off, it is ready for use. Mushrooms can be grown in cellars, sheds, stables, or in any other such building, where they will be protected. Where it is intended to cultivate them permanently, a covered shed will be found the most convenient place in which to perform the necessary work. For this purpose a dry situation should be

closed, the more sheltered the better, on which to build a shed of sufficient dimensions. A bed four feet wide, and twelve feet long, will give an ample supply for a moderate-sized family. The shed may, however, be erected ten feet wide and sixteen feet long, giving space for working materials, and two beds if required. The shed should run from north to south, having a close roof, and weather-boarded. With the exception of four apertures as windows, to be covered with shutters, this erection might be made ornamental, having a portion of it for a tool-house. Having marked out the space for the bed, throw out the earth about six inches deep, laying it regularly at the side, and if good, it will do for earthing the bed. In the trench, lay four inches of good dung, not too short, for forming the bottom of the bed; then lay on the prepared dung about six inches thick, regularly over the surface, beating it down firmly with the back of the fork. Put on other six inches, and so on till eighteen or twenty-four inches thick. In that state it may remain ten or fifteen days, during which time the heat should be examined about the middle of the bed, by thrusting a small stick in several places, and when found of a very mild heat, the bed may be spawned. The spawn bricks for this purpose should be broken regularly into pieces about an inch and a half or two inches square. These pieces are best put in with the hand, raising the dung up a few inches with the one, while with the other the spawn can be laid in and covered. This ought to be done in every six inches of the surface of the bed. If the sides of the bed are made of a sloping form, they can also be spawned. After spawning, level the surface with the back of the spade, beating it gently, after which it may be earthed. Procure that of a sandy, loamy nature, if from a pasture, so much the better. Break it up and make it fine, laying it on two inches thick. Level it very neatly with the rake, and beat it closely and evenly. When the whole is finished, the bed must be covered a foot thick with good clean straw or natural hay, over which lay mats or canvas in severe weather. Examine the bed every few days, and if the heat increases, diminish the covering of straw, which is better than to take it off altogether. In about five weeks, if the bed be under proper cultivation, Mushrooms will make their appearance, and in two days more they will have grown to a sufficient size for use. Some people cut them, but it is decidedly better to give them a gentle twist in the

ground and draw them out, filling up the cavity with a little fine mould, gently pressed in level with the bed. This method of gathering is much better than *cutting*, as the part left generally rots and breeds insects, particularly the wood-louse, which is very destructive to Mushroom beds.

Sometimes it happens that a bed suddenly ceases to be productive. This may arise from various causes, but most frequently from the cold state of the bed in Winter, or a dryness of soil. In the former case, an additional covering should be given, in the latter, water in a milk-warm or tepid state should be applied moderately, for two or three mornings in succession. After each watering leave the covering off for about an hour. Soft water should be used for the purpose. In Summer the beds will require watering every two days, though in Winter they may not need it in as many months. A good bed will be productive for three months, though it may occasionally happen to wear out in half that time.

From these observations, an ingenious mind can make a Mushroom bed in a multitude of situations, all obtainable where there are cellars, stables, or other buildings. We would not despair even in the open air during Winter, covered with plenty of litter, under a few boards to ward off cold rains. In Spring and Summer, any quantity may be grown in this way.

It will be observed, in the cultivation of every other vegetable, we either sow or plant some evident material of reproduction; but in the cultivation of Mushrooms, we neither sow nor plant any antecedent production of seed, plant, or root, yet it is certain that Mushrooms are reproduced by a process in which the dung of certain animals forms the chief instrument, and on the goodness and strength of that ingredient, in whatsoever way it is made, chiefly depends the crop. We are aware that this vegetable appears in certain situations without any apparent cause, though we feel fully satisfied that there are inert ingredients that only require a combination of influences to produce certain results, and these results in nature are unerring.

The young Horticulturist should never desist from making moderate and well-considered experiments. Let him never suppose that perfection has already been attained. Acumen and perseverance should be pre-eminently conspicuous in the gardener, who has many vicissitudes by weather, insects, and accidents to encounter, and he should be prepared with resources to resist them all.

Editorial Notices, &c.

THE AGRICULTURIST POST FREE.—Some of our subscribers have recently informed us that the Postmasters, from whom they receive the AGRICULTURIST, have been charging postage on its delivery, under the impression that it was their duty to do so under the new postage act. We were fully aware that we were correct in stating the "AGRICULTURIST" to be exempt from postage, but in order to place the matter at once upon a satisfactory footing, and prevent any mistakes on the part of the Postmasters, in future, we addressed a communication to the Postmaster General's Department, asking for an official statement that the AGRICULTURIST is post free. This we have now obtained. It was received too late for insertion in this number, but will appear in the next. In the meantime all concerned will please notice that the AGRICULTURIST, as a purely agricultural journal, is post free under the law, when mailed direct from the office of publication.

SHORT HORNED CATTLE.—Parties desirous of obtaining animals of this celebrated breed, would do well to pay a visit to the Hon. A. Fergusson, of Woodhill, who advertises in another column some cows and all calves for sale this Spring. Mr. Fergusson's herd is well known to be select, and largely imbued with the blood of the best families of Shorthorns.

AGRICULTURAL SEEDS, &c.—We beg to call the attention of our readers, and Agricultural Societies in particular, to Mr. Manning's advertisement in the present number. Societies may now have the opportunity of purchasing seeds that may be relied upon for being fresh and genuine at wholesale prices.

We also direct attention to Mr. Simmer's advertisement, in the same line of business.

THE AGRICULTURIST—TO SOCIETIES AND CLUBS.—In sending orders with lists of names, parties will oblige by giving eleven names for each five dollars remitted, so that we may know to whom to address the eleventh copy. When a parcel is to be addressed to one individual we send 11 copies for each \$5 received. When parties send orders without accompanying them with the cash, intending to remit that as soon as the full list is made up, we send only the exact number ordered, leaving to the parties to remit us \$5 for each 11 copies as soon as their list is complete. We give these explanations in order to prevent confusion or mistake.

Market Intelligence.

TORONTO MARKETS.

Saturday, Jan. 23, 1860.

The attendance on the market on Saturday was limited to a few teams. Two loads of fall wheat were bought, one at \$1 20, and the other at \$1 25.

SPRING WHEAT was sold at \$1 00 a \$1 02. These rates were not, however, a fair test of the market.

OATS are quiet, selling at 38c a 40c.

The Pork market is firm. Hogs, well fed, weighing 250lbs., were bought last week at \$5 87½ a \$6 25; over that and equal to 280 lbs., \$6 30 a \$6 40 in a few cases. Lower qualities brought \$5 25 a \$5 70 per 100lbs.

BARLEY 60c a 65c per bushel.

RYE 70c a 75c.

PEAS 58c a 61c.

POTATOES 30c a 35.

HAY \$17 a \$24 per ton.

BEEF—Very extra animals have brought \$5 50 a \$6 00; but the ruling price for first class beef is \$5 00 a \$5 25. Second rate animals \$4 50, and some have been sold as low as \$3 00 a \$3 50 per 100lbs.

SHEEP scarce at \$4 a \$5 each.

LAMBS \$3 a \$4 each.

CALVES plentiful at \$4 a \$5 each.

BUTTER—Roll butter is more freely offered, and is steady at 18c a 20c. Tub is not in such good request, and is rather dull at present at 15c a 16c for No. 1.

DRIED APPLES.—A. M. Smith & Co., advertise a nice lot of dried apples at \$1 75 per bushel of 22lbs., wholesale, and \$2 00 in small lots.

MONTREAL MARKETS.

MONTREAL, Jan. 28.

FLOUR very dull and sales limited to small parcels of best No. 1 superfine, which are taken slowly at \$5 15 per bbl. Fancy is held at \$5 30 a \$5 40, and extra \$5 80 a \$6 20 for May delivery. 2,000 bbls have changed hands at \$5 25 for No. 1 superfine. No buyers at over \$5 20.

GRAIN—Wheat; small sales of Upper Canada spring at \$1 16 per 60lbs. Peas—Sales of shipping parcels at 80½ per 66 lbs, closing firm.

ASHES in demand at \$5 80 for pots; \$5 75 for pearls. Receipts rather liberal.

BUFFALO MARKETS.

BUFFALO, Jan. 28.

The market for all descriptions of produce continues dull and nearly nominal.—Nothing is doing in wheat. Corn is dull and depressed. Oats nominal. Rye and Barley nominal. Provisions quiet; sales 100 bbls uninspected mess pork at \$16 00. Dressed hogs also quiet, with retail sales at \$6 25.

NEW YORK MARKETS.

NEW YORK, Jan. 28.

FLOUR dull and drooping; sales 3,000 bbls at \$4 95 a \$5 05 for superfine State; \$5 20 a \$5 30 for extra State; \$4 95 a \$5 05 for superfine Western; \$5 20 a \$5 30 for common to medium extra Western; \$5 65 a \$5 75 for inferior to good extra shipping brands round hoop Ohio. Canadian flour unchanged; sales 200 bbls at \$5 50 a \$6 75. Rye flour steady at \$3 75 a \$4 45.

GRAIN.—Wheat very dull and without sales of moment. Rye quiet at 91c a 92c. Barley dull; sales at 70c a 83c. Corn quiet and unchanged; sales at 78c a 80c for new, white and yellow. No receipts. Oats dull at 45c a 46 for Canadian, Western and State.

PROVISIONS.—Pork firm at \$16 37 a \$17 60 for old mess; \$11 75 for old prime, and \$13 62 for new do. Beef steady and unchanged.

BRITISH MARKETS.

LIVERPOOL, Jan 11.

BREADSTUFFS quiet. Flour had limited sale; Western Canal 23s a 24s; Philadelphia and Baltimore 24s a 25s. Wheat—moderate consumptive business; white and mixed 8s a 11s 6d; red 8s 6d a 10s per 100 lbs.—Corn—average consumptive demand; white 38s a 39s; yellow 32s 6s; mixed 31s 6d a 32s.

PROVISION MARKET.—Beef not so animated this week. Pork—American has attracted more attention; prime mess Eastern, per bbl of 200 lbs, 60s a 65s; old U. S. prime mess, Western, repacked, 50s a 60s. Lard 57s a 59s. Ashes—pots 27s 6d. Sugar steady at 95½ a 95¼.

Advertisements.

QUEEN'S SEEDSMEN.

PETER LAWSON & SON.

EDINBURGH, 1 George IV. Bridge.
LONDON, 27 Great George Street, Westminster, S. W.

ON ACCOUNT OF THE NUMEROUS applications which have been made to PETER LAWSON & SON, to send their Lists of Seeds and Nursery Produce to the United States and Canada, they beg to inform the Trade in America that they are prepared to furnish them with

PRICE LISTS

and to assure them that any orders they may be favored with will receive their best attention.

All orders must be accompanied by Cash, Satisfactory References in England, or may be forwarded through

CRAIG & NICOL,

No 6 Bowling Green, New York.

JANUARY, 1860.

SEEDS! SEEDS! SEEDS!

AS the season is near at hand for parties requiring GARDEN & FIELD SEEDS to look out for the best to be had, I would beg to call the attention of all, and at present, particularly of WHOLESALE PURCHASERS, to my fresh stock which is now about completing; as for quality and extensiveness it cannot be surpassed by any establishment in the country.

Wholesale priced catalogues (for the trade only) are now ready, and may be had on application.

Catalogues for this season, containing many new and rare acquisitions, together with numerous useful remarks and hints for the raising of Vegetables from Seed, &c. will also be ready in a fortnight.

Orders from a distance attended to with usual care and despatch.

J. A. SIMMERS,

Seedsmen.

Corner of Front St. and West Market Place
Toronto, Jan. 30, 1860.

**YONGE STREET SEED STORE
AND FLOWER GARDEN,**

Established 1836.

**Fresh Garden, Field and Flower Seeds,
for Spring sowing.**

THE Subscriber begs to inform his friends and the public, that his stock of Fresh Seeds is now complete, and very extensive, embracing almost every sort of Seed that is adapted to the country.

The stock of Agricultural Seeds is large and well selected, and the vitality of each sort being fully tested, the genuineness of the seeds may be fully relied upon.

Comprising a large stock of:—Spring Wheat, Spring Tares, Tartar and Poland Oats of the most approved kinds; Field Peas, including Golden Vine, and other approved sorts, White and Black Eyed Marrow Fats; Barley, two and four-rowed; Imported Purple and Green Top Swedish Turnip, Imported White Globe do., Imported Yellow Aberdeen do., Imported Six-weeks or Stubble do., Imported Red Round, Red Globe and several other sorts of Turnips; Long Red and Yellow Globe Mangel Wurzel; Sugar Beet and Field Parsnip, Large White Belgian Carrot and Spring Rape; Long Orange, Red, Surrey, and Altringham Carrot; Timothy, Orchard, and English Eye Grasses; Red and White Dutch Clover; French Lucerne, Cow, and Hungarian Grasses, Alsike or Perennial Clover; Yellow and White Millet; Early Potatoes of the most approved sorts; Corn, 8 rowed Early Canada, King Philip, Yellow Dutch, and several other sorts.

*Horticultural Books and Garden Tools,
Draining Tools, One Horse Ploughs, and
Cultivators of all kinds.*

The Subscriber has also a full and general assortment of all kinds of Garden Seeds suitable for the country, a catalogue of which, with directions for sowing seeds, can be had gratis.

Merchants and Agricultural Societies ordering seeds in bulk will be supplied at wholesale prices.

Complete assortment of Garden Seeds daily put up in small papers, with directions for sowing, and sold by the box, containing 150 papers at very moderate prices.

Twenty packages of Flower Seeds, choice sorts, will be sent free by post to any part of the province, to the address of any party remitting \$1, free of postage, or 25 packages, postage unpaid.

JAMES FLEMING,

Seedsman to the Ag'l As. of U. C.

Toronto, February, 1860.

6-t

YONGE STREET SEED STORE.

**CHOICE VEGETABLE & FLOWER SEEDS
FREE BY MAIL.**

THIRTY SIX VARIETIES FOR TWO DOLLARS.

THE Subscriber, wishing to give parties who reside at a distance an opportunity to test the quality of his Seeds, will, on receipt of \$2, free of postage, send free to any Post Office in Canada, 24 Full Sized Papers of VEGETABLE SEEDS, many of them containing half an ounce of seed, and 12 Papers of Choice FLOWER SEEDS, with Descriptive Catalogue and Box included—the seeds to be of my own selection. None but the most useful and desirable varieties will be sent.

JAMES FLEMING.

Seedsman to the
Agricultural Association of U. C.

Toronto, Jan., 1860.

To Agricultural Societies, &c.

THOROUGH-BRED NORTH DEVON BULLS to sell or let for the season.

"Colonel," 569, A. H. B. The Colonel took the first premium as a yearling at Brantford.

"General," 571, A. H. B. The General took the first premium as a two-year old at Toronto.

Apply to

DANIEL TYE.

Wilmot. Co. Waterloo.
Jan. 3, 1860.

IMPROVED SHORTHORNS.

THE HON. ADAM FERGUSSON, WOODHILL, WATERDOWN, P. O., will have Seven Thorough-bred Durham Cows to calve in Spring. These cows are in calf to "ETHELBERT," bred by Samuel Thorne, Esq., and have a large portion of "DUGHESS" and "BATES" blood. They may be seen at any time at Woodhill, within a half hour's walk of Waterdown Station, G. W. R. R.

Orders for bull calves must be sent by the 1st of March. Full pedigrees will be furnished. Price of each calf \$60.

Four of the Cows will be sold at moderate prices.

WOODHILL, Jan. 2nd, 1860.

THE AGRICULTURIST.

ARRANGEMENTS FOR 1860.

THE "AGRICULTURIST, AND JOURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE OF UPPER CANADA" for 1860, will be published on an entirely new system.

It will appear twice a month, and will consequently be much more useful as a medium of intelligence on all subjects affecting Agricultural Societies, and farmers generally, than heretofore.

Each semi-monthly number will consist of 32 pages, and will be printed on fine white paper.

Notwithstanding the increase of size, and of times of publication, the price to single subscribers will be only half a dollar for one copy per annum.

Further, even at this low rate, a bonus will be given of one free copy for every 10 copies ordered and paid for in advance. That is to say, for \$5 remitted, 11 copies will be mailed; for \$10, 22 copies; for \$15, 33 copies will be mailed, and so on.

The *Agriculturist* is Post Free.

It will consequently be the cheapest paper of its kind, and contain the largest amount of reading matter of any published on this continent.

In addition to the very low terms of subscription, as a further remuneration to those who exert themselves to obtain subscribers, the undermentioned money premiums will be paid to those who send in the largest lists accompanied with the amount, before or on the 1st day of April next. Subscriptions will be received at any time, and the amount of each list reckoned up on the 1st April. The money must be received, not merely mailed, on that day. The following are the prizes offered:—

To the officer of any Agricultural Society, member of a club, or other person who shall send in the largest list of subscribers, accompanied with the cash, on or before the 1st April next, a money prize will be paid of..... \$20

To the person who shall send in the next largest list..... 19

To the person who shall send in the next largest list..... 18

To the person who shall send in the next largest list..... 17

To the person who shall send in the next largest list..... 16

To the person who shall send in the next largest list..... 15

To the person who shall send in the next largest list..... 14

To the person who shall send in the next largest list..... 13

To the person who shall send in the next largest list..... 12

To the person who shall send in the next largest list..... 11

To the person who shall send in the next largest list..... 10

To the person who shall send in the next largest list..... 9

To the person who shall send in the next largest list..... 8

To the person who shall send in the next largest list..... 7

To the person who shall send in the next largest list..... 6

To the person who shall send in the next largest list..... 5

To the person who shall send in the next largest list..... 4

To the person who shall send in the next largest list..... 3

To the person who shall send in the next largest list..... 2

To the person who shall send in the next largest list..... 1

"AGRICULTURIST OFFICE,"
Toronto, November, 1859.

FOR SALE.

A THOROUGH-BRED AYRSHIRE BULL
3 years old.

RICH. L. DENISON.

Toronto, July 30, 1859.

University College, Toronto.

THE Lectures in this Institution of SCIENCE AND PRACTICE OF AGRICULTURE, will commence on MONDAY, NOVEMBER the 7th, and will be continued (five lectures a week), till the beginning of April, 1860. Agricultural students can attend other courses, such as Chemistry, Geology and Mineralogy, Natural History, including Botany, English Language and Literature, &c. as they may desire.

Particulars may be obtained by applying either personally or by letter to PROFESSOR BUCKLAND, University College, Toronto.
Toronto, September, 1859.

The Agriculturist,

OR JOURNAL AND TRANSACTIONS OF THE BOARD OF AGRICULTURE OF UPPER CANADA,

is published in Toronto on the 1st and 15th of each month.

Subscription—Half a dollar per annum for six copies; Eleven copies for Five Dollars; Twenty copies for Ten Dollars, &c.

Advertisements—Five cents per line each insertion.
Editors—Professor Buckland, of University College, Toronto, and Hugh C. Thompson, Secretary of the Board of Agriculture, Toronto, to whom all orders and remittances are to be addressed.

Printed by Thompson & Co., 77 King, Street East, Toronto.