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
- [x] Bound with other material/ Relié avec d'autres documents
- [x] 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.

- [ ] Coloured pages/ Pages de couleur
- [ ] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [x] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [ ] Pages detached/ Pages détachées
- [x] Showthrough/ Transparence
- [x] Quality of print varies/ Qualité inégale de l'impression
- [x] 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:

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. X. No IX. (NEW SERIES.) TORONTO, CANADA, MAY 15, 1873. $1.50 PER ANNUM. SINGLE COPIES 3 CTS.

The Field.

The Potato Disease.

The current part of the *Journal of the Royal Agricultural Society of England* contains a paper from the pen of William Carruthers, F. R. S., consulting Botanist to the Society, on the potato disease, abounding in facts, and the results of experiments that throw much interesting light on the nature of this destructive, and hitherto, but little understood malady.

According to this writer the potato disease has been known for ages in the western countries of South America, and just thirty years ago, it made its appearance in a malignant form, and considerably injured the crops, both in the United States and Canada, where it re-appeared the following year It was first detected in Europe during the latter part of July, 1845, in Belgium; and within two months appeared in the British Islands, Denmark, France, Germany and Russia, and it has continued with more or less intensity ever since. Last year it was again particularly destructive in several places in the United Kingdom, so that the price of potatoes in the British markets has reached an unprecedented mark. The Earl Cathcart, President of the Royal Agricultural Society, has offered a prize of £100, for the best report, founded on scientific investigation and experience, on the nature of this insidious disease, and the most practicable and efficient methods of arresting its progress.

The following quotations, giving the author's views on the present state of knowledge regarding the potato disease will be found interesting:—

"There is no longer any dispute as to its real cause. All the notions which supposed it to be produced by physical agencies, or to be the indication of a defective method of cultivation, or of a deterioration of the plant, have been conclusively set aside Nor can it be held that the microscopic fungus, which is known to be invariably found in diseased potatoes, is the result of the disease and not its cause. Since De Bary has produced the disease by placing the spores of the fungus on the leaves and tubes of healthy potatoes.

"Beginning this narration with De Bary's experiment we may trace intelligently the history of this baneful parasite, and notice the nature and progress of the injury it produces in the potato. The seeds, or more properly spores of the fungus are minute and void bodies, so small that the greatest diameter is not more than the eight-hundredth of an inch long. When a spore rests on the under surface of a leaf, and there is sufficient moisture, it pushes out a slender tube, through a ruptured opening in its coat. This tube penetrates the epidermis on the spot where germination takes place, or finds its way to one of the innumerable openings or stomates which abound on the lower surface of the leaf, and passing through the opening enters the tissues. The slender tubular root called the mycelium rapidly grows, pushing its way everywhere through the substance of the leaf. It branches and rebranches freely; the brown coloring matter contained in it gives the spotted appearance to the leaves, which indicates to the eye the existence of the disease. The mycelium sends out, through the stomates, branches into the air that give a mouldy aspect to the under surface of the leaf. The ultimate branches of this external growth are somewhat interruptedly swollen, and many of them bear minute oval bodies at their extremities. These are the spores. The mycelium passes down the leaf-stalk into the stem; through this it obtains access to the other leaves as well as to the underground branches, and through them to the potatoes themselves, which are indeed only enlarged and shortened portions of the underground stem. De Bary placed some spores on the leaves of a healthy potato, on February 4th; the day following the tubes of the mycelium had penetrated the leaves; on the 8th the mould appeared on the under surface covered with fruit, and on the 9th the whole plant was diseased.

"The individual cells which are pierced by the mycelium are destroyed, and the starch-granules contained in the cells are attacked and consumed. Putrefaction soon begins, affecting first the cell-walls and then the starch. Payen has put it beyond doubt that the mycelium consumes the starch, for in his investigations he detected the granules attacked by the mycelium threads, and he made the injury more apparent by using iodine, the action of which on coloring starch granules is well known. By the ordinary processes all the starch can be separated from diseased potatoes, not only that contained in cells yet untouched by the mycelium, but even the granules that remain uninjured by the mycelium or the surrounding putrefaction.

"The mycelium does not naturally fruit on the upper surface of the leaf, on the stem, or on the tuber of the potato, as these parts are either destitute of stomates or but partially furnished with them, and the mycelium does not send its fruiting branches through continuous epidermal structures, but when any of these parts of the potato, attacked by the parasitic fungus, are cut and placed in a moist atmosphere, the fruiting branches speedily appear Some of the oval heads at the terminate the branches are larger than the others, and contain within them from six to sixteen minute bodies. When water is applied either artificially or naturally, the outer covering bursts and the contents are liberated. Each of the node spores thus set free moves about in the water by the aid of two cilia. In a short time the motion ceases, and if a proper nidus exists, the spore germinates."

This minute fungus belongs to the genus *Peronospora*, and has received the name *Peronospora infestans*, Mont. In order to destroy effectually the parasitic fungus, it is recommended that diseased plants whether leaves, stems, or tubers, should be destroyed by fire. If they are left to decay or become incorporated with the manure these rest-spores and mycelium will most probably germinate as soon as placed under favorable conditions.

"De Bary has shown by experiment that there is nothing in the potato plant more than in any other to predispose it to the attack of the fungus. It is not weak or unhealthy plants that are attacked, but wherever the spores rest and finding the suitable moisture germinate, there the disease will appear. When only the fungus has got a footing in a crop of potatoes, its rapid growth, the little time required to develop fruiting branches, and the innumerable number of spores produced make its progress very rapid. Even when the disease is first noticed by the cultivator, it has taken such a hold of the crop that its perfect cure is, I believe, impossible. As moisture is so necessary to the development of the spores, every means should be adopted to prevent undue moisture. No soil is exempt; but there is less danger of an attack and less injury when the disease makes its appearance in thoroughly drained soils.

As it amounts almost to a moral certainty that the approaching season will witness in some parts of this Province the re-appearance of this destructive pest, in an intensified degree; cultivators of potatoes should keep a timely look out, and as soon as signs of the enemy are manifest, every effort that is practicable should be made at once, to arrest its progress. Notwithstanding our author speaks pretty positively that when the disease has obtained a strong hold of the crop its entire removal in the present state of knowledge, is impossible; yet we know that in moderately sized patches careful hand-picking has been found effectual; and in the great majority of cases the timely application of *Paris Green*, as recommended by the Entomological Society in a report to the commissioner of agriculture for this Province, has been attended with more or less success, in mitigating the evil and arresting its further advancement.

As a general rule, manure does best on heavy soils applied as a broadcast top-dressing; on light soils it is better to plough it in with shallow furrows. There have not been a sufficient number of accurately conducted experiments with top-dressing in summer, to determine satisfactorily what amount of manure would be thus wasted by exposure. We suspect, however, that this great loss is commonly over-estimated. Manure spread on grass land early in autumn, or even in August, has not only proved of great value to the grass, but has had a marked effect on the following corn crop, planted on spring-ploughed soil. We should prefer spreading to leaving in heaps, although the latter is most common. When spread evenly every shower of rain washes the soluble and enriching parts into the soil; but if in heaps, it would be more likely to lose by fermenting, and rains would be no benefit to it. Without knowing anything of the nature or condition of the soil, we should be inclined to recommend, as the safest course, to plough in the manure as shallow as practicable after being thoroughly spread and broken by a surface harrow, leaving, however, a portion of the field with the manure exposed, by way of experiment.—*Cultivator.*

Super-Phosphate.

On an old field of gravelly loam, that has been under the plow most of the time for sixty years, I sowed wheat last spring. It had not borne a crop of wheat for a dozen years. Last year it gave a very good crop of corn. After the wheat was up, I sowed upon a strip of the field Canada phosphate, at the rate of four hundred pounds per acre. The result was quite striking in the thicker and stronger growth of grain. I judge that the crop was increased, where the phosphate was applied, some thirty per cent Had I sowed phosphate over the whole field, I believe the increase of crop would have paid for the fertilizer, and left a handsome balance. Here was a strong, manured soil unable to yield a full crop of wheat for lack of one element.

On a ridge of pasture land, of similar soil, I measured and staked off a certain plot and sowed the same phosphate, at the rate of five hundred pounds per acre. All summer long, though the cattle kept the grass grazed down close, the plot could be distinguished at a distance by its livelier green and closer turf; the phosphate must have doubled the pasturage.—*Vermont Farmer.*

Concentrated Fertilisers.

The "greater the truth the greater the libel," when enunciated by a newspaper without malice, and with no thought except the public good, receives a new illustration in the action of some New York newspapers recently, which published the reports of analysis of fertilizers sold by some of the leading firms in New York city. Some one went to the various guano and other manure houses and purchased in the regular way what was offered for sale, and only two were found to contain the real article they pretended to sell. The others sold articles made up of various trash from nearly half brick-dust in some cases, to inferior guano worth less by seven or eight dollars per ton, to the best article, for the best Peruvian guano Besides the frauds in quality there was the imposition in price, in some instance some charging ten dollars per ton more for the identical article, supplied by a near neighbor. This truth is surely great enough to warrant the law in regarding it as a tremendous libel on the character of these truly innocent men. That any one should dare to tell another that he paid for guano and received brick-dust, is a terrible slander; and when to this it can be proved that the man had no malice in reporting the facts as he found them, that indeed he was taking on himself rather an unpleasant duty in behalf of the public, one imposed on him by the New-York Agricultural Society, we do not know whether anything short of capital punishment on the gallows, can fully expiate the enormity of the offence! It is said by a cotemporary that the gentlemen who served on the committee, Hon. J. Staunton Gould, Isaac H. Hicks, and W. H. Habershaw, are already threatened with prosecution.—*Germantown Telegraph.*

Wood Ashes.

Hard-wood ashes is one of the most valuable fertilisers that a farmer can use. It is almost an impossibility for him to be at fault in the manner of using. If sown broadcast the effects may not be seen so pointedly in the immediate crop, but they will be permanent, and a crop of grass or broadcast grain several years afterward will feel the influence of the ashes. For wheat it has been recommended to use ashes mixed with plaster, and if the wheat is sown in drills, this mixture should also be thus sown. For grass, ashes may be used as a top-dressing. It is stated that as much as 200 bushels per acre have been thus used in Connecticut. We think half that amount fully enough for one dressing. For potatoes and corn, the ashes should be put in the hills; but we look upon composting as the best mode of using ashes. They may be mixed with muck, barn-yard manure, or both those substances, and also phosphate of lime, with great benefit. There is hardly a plant which does not contain one or the other of the elements which hard-wood ashes add to the soil. There is a great difference in ashes, depending on the wood from which grown and the soil from which the tree grew. Beech is probably the richest in potash, though elm is very near the same, or greater. If trees are grown on a soil rich in potash, that element will be in greater proportion, while if grown near the sea-shore where soda is in the soil, that alkali takes the place of the potash to some extent. A valuable substitute for ashes may be made from the kairit, or German potash salt, by mixing that material with common rich earth woods mold. One hundred pounds of kairit mixed with twenty-five pounds fresh burned lime and 400 pounds of woods earth, would make full as valuable a dressing as the average hard wood ashes.—*N. Y. Times.*

Facts About Manure.

The author of "Ogden Papers" for the *American Agriculturist*, has paid a visit to Dr. Voelcker. In his account of it he says:

We had been taught that from the time when the manure was first voided by the animal it was subject to constant loss from the evaporation of ammonia, its most valuable ingredient, and that consequently it was the only safe plan to compost it with muck or some other absorbent material. Dr. Voelcker proved, by a series of analyses of manure at different stages of decomposition, and after various sorts of treatment, that there is no formation of volatile ammonia except when the mass is sufficiently large for the accumulation of enough heat to favor an active decomposition, and that even then there is no evaporation of ammonia, for the reason that the organic acids which are simultaneously formed are always sufficient to take it up and form non-volatile compounds. At the same time, although these compounds are not subject to evaporation, they are highly soluble, and the juices flowing from the dung-heap, and the rain water passing through it remove it most easily. Consequently, it is of the greatest importance that manure should be kept under cover, if it is kept in store at all. The most important deduction from these investigations is, that the much-reiterated recommendation of agricultural writers that on no account should manure be taken to the field (unless to be composted) until it could be almost immediately ploughed under the soil, was not well founded. The best practice of all, is one which many of the most successful farmers have always followed, and against which the agricultural press has levelled its biggest guns, the practice, namely, of hauling manure afield as soon as a few loads have accumulated, spreading it at once over the ground, and ploughing it under early or late or not at all, according to circumstances; the best effects following its application to the surface of grass-land, or its harrowing into the very top-most film of ploughed land. In neither of these cases can ammonia escape, because no volatile ammonia is formed, while the soluble parts, and all become soluble in time, are distributed through the soil by the water of rains the more evenly, the nearer to the surface they lie When they are once absorbed by the soil they are held in an available form until required by the roots of plants.

LIME IN CROPS.—There is said to be carried off from the soil nine pounds in twenty-five bushels of oats, and fifteen pounds in thirty-eight bushels of barley. There are thirty-five pounds of lime in two tons of rye-grass; one hundred and twenty-six pounds in two tons of clover; and one hundred and forty pounds in twenty-five tons of turnips, and two hundred and seventy pounds in nine tons of potatoes. Some soils contain abundance of lime for a thousand years, while others require an occasional application of lime as a fertilizer.—*Ex.*

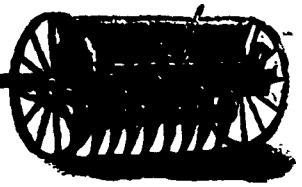
The best time to apply manure as a top-dressing for grass is probably early in the spring. But I have been astonished to find how rapidly the manure works down among the grass (or how soon the grass works up into the manure) and disappears, no matter when applied. Some farmers hesitate to top-dress their grass land for fear it may give the grass a rank taste. If the manure is evenly spread and thoroughly harrowed there is no difficulty of this kind. Sheep and cows will eat the top-dressed grass in preference to that in the same field where no manure has been applied.—*Joseph Harris.*

REFUSE OF TANNERIES.—A correspondent in Monroe county, Pa., writes to the *Country Gentleman*, as follows:—We use much of it here, and consider it a valuable fertiliser. We pay $1 to $1.25 per ton for it, and haul sometimes two or three miles. Our land is what is called heavy soil, although I have seen it used with good results on the "sandy flats" along the streams. We haul and spread from the wagon, four or five tons to the acre. It is generally applied on the ploughed ground, and worked in by cross-ploughing and harrowing. It does best on new land, when sown to clover, yielding heavy crops, and the opinion here is that lands treated with this manure keep in grass longer than with any other manure which can be applied.

Agricultural Implements.

SEED DRILLS—*Continued.*

The best drill at present in the market, and one which will be found a boon to any farmer, is constructed on the principle of the celebrated "Brickford and Huffman" drill, and known under different names as the "Farmer's Friend," "Farmer's Favorite," "Combination Drill," &c., &c.



The distinguishing features of this machine are a double force feed or distributor, a sliding grain bottom, rubber leather funnels with metal hangings, jointed ground tube, double reversible champered steel tube points, automatic gear shifter, and a tube shifter.

The double distributors are constructed with two separate feeds, one upon either face of the distributing wheel, and one of much greater capacity than the other.

The smallest of feeds will sow wheat, rye, buckwheat or flax in the very best manner;—the discharge being constantly within full view of the operator, and subject to any adjustment without injury to the seed, or a possibility of bunching" or "stooling" the grain.

The larger feed sows oats, corn, peas, barley and all coarse grains just as perfectly as the other set sows the finer ones. This double feed adds nothing to the weight of the implement, nor does it increase its mechanism, whilst it doubles its usefulness, by adapting it to the seeding of spring grain,—a work heretofore a comparative failure when attempted with most or all of the earlier kinds of drills.

The sliding grain bottom is a series of inclined planes or bevels, so connected at the sides as to form perfect funnels over each feed or run, affording no place of rest or shelter for the grain and making certain that with grain in the box of the drill, the distributors are fed; and dispensing wholly with the uncertain and unreliable "stir-rod," which used to be employed for the purpose of stirring up the grain at the point where it entered the distributor.

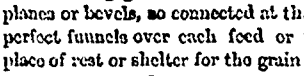


FIGURE 9.

In some cases "rubber leather" funnels are used, which conduct the seed from the distributors to the earth, combine the good qualities of both the rubber conductors and the metal funnels, and avoid the faults of either style. The tops are metal, with strong ears for carrying them, and the rubber leather is much stronger than the common gum fabric.

The manner of attaching them permits their lateral movement to accomodate the position of the tubes without bending, bruising or chafing, and thus saves the breakage of funnels.

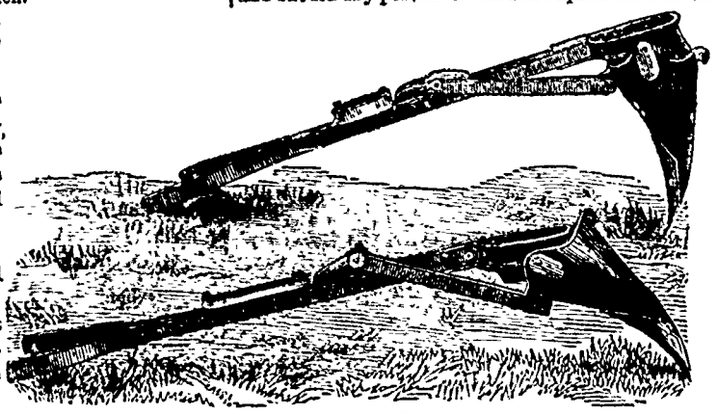
The ground tubes are also sometimes jointed; the top remaining always in the same relative position to the drag-bar and conductor.

The joint also permits the tube to turn nearly at right angles with the top—to skip over an obstacle. Each tube has a reversible steel point, which by means of a rivet, may be reversed when one side is worn. The tubes are likewise attached to the drill in front by wrought iron leaders or drag-bars, to which they fasten with a brace and wooden pin, amply strong to sustain the draught of the tube, but yet weak enough to give way before the tube or leader is broken by catching against a root.

A spring tube may also be had, which is in every respect the same as the other, except that a spring operates to return and fix the tube in place, after

passing a fixed obstacle, thus avoiding the double delay of returning the tube by hand, and of replacing a wooden pin when broken.

Another recent improvement is a "tube shifter," worked on a lever principle. It is designed to throw the tubes (which ought generally to be in line) from side to side suddenly, to pass stony or lumpy places, and then return to line again. The attachment is neat, cheap and convenient, and a boy can work it easily.



TUBE SHIFTER.

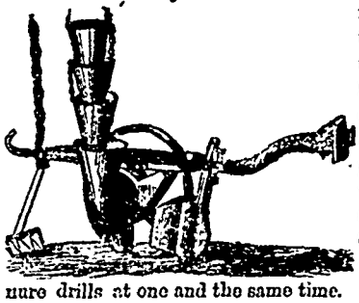
A still later improvement again connects the tube elevator or back roller with the gear-lever by means of which it operates at the precise moment when wanted; being certain to put the drill in gear with the tubes down, and in elevating them to throw it out of gear. This puts the implement under the complete control of the operator by the use of a single lever.

The fertilizer or guano attachment, sows guano, bone-dust, super-phosphate, lime, ashes, salt, &c., either in a dry or damp state. Owing to the strong affinity of guano and super-phospate for damp, they often clog, and it was therefore at one time quite a difficult matter to sow them by means of machines, except in a dry state. By a recent alteration in the shape of the cavity through which these fertilizers are distributed, this difficulty has been overcome.

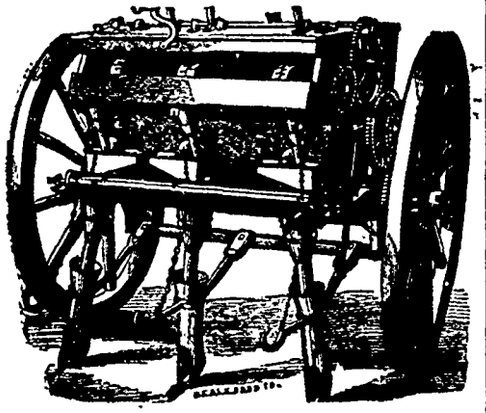
The grass seeder which weighs only about 20 lbs., is attached to the drill in rear of the tubes, and sows broad-cast in desired quantities from a quart or two to half a bushel per acre.

All the various implements here specified are easily accessible to the Canadian farmer—especially the last—itself, or modifications of it being manufactured at most of the leading establishments in the Dominion.

The system of drilling in Great Britain, as well as the drills by which the system is carried out have been advanced to a much greater degree of perfection than on this side the Atlantic. There, they have manure drills to deposit either solid or liquid matters or both. Or they have implements which answer the purposes of both the seed and manure drills at one and the same time.

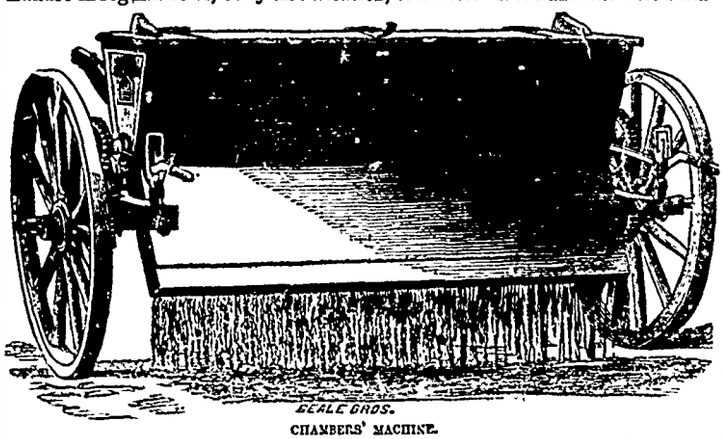


Of the first class Chandler of Westbury, (Wilts), manufactures an excellent liquid manure drill, with

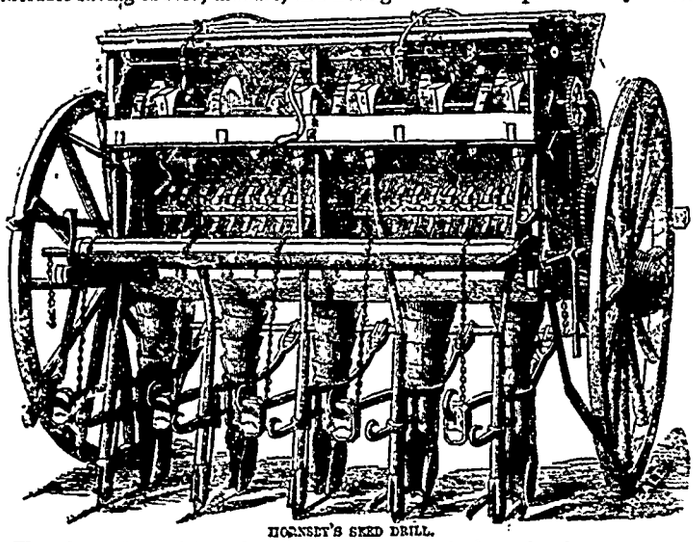


stirrers working between the buckets, so that the whole of the manure is set in motion as soon as the machine is set to work, and consequently every part of the field receives its share of manure equally strong, and should any portion of the soil require *more or less* than the general distribution, the machine is so arranged that the attendant can easily vary the quantity.

The same implement may be used either to deposit manure in regular rows, or by an alteration, to scatter it broadcast, and in both cases as well as in the case of nearly all the British drills a most decided improvement can now be applied in the shape of Chambers' patent drop lever, which, in the distribution of liquid manure has been found to effect a saving of two-thirds of the water usually applied, also a considerable saving of seed, manure, and hoeing.



CHAMBERS' MACHINE.



HORNSBY'S SEED DRILL.

Hornsby & Sons, of Grantham, (Lincoln), also make a very superior general purpose drill for manure and seed, both of which may be deposited simultaneously down the same coulter, or through separate ones at the pleasure of the operator. It may be employed likewise for seed alone or manure alone if desirable, and the uniformity of depth in delivery is ensured by weighted levers, which press equally upon all the coulters separately.

Prizes for Ploughmen.

As a man ploughs, so shall he reap. We are a nation of scratchers of the soil, and our furrows are as crooked vertically as they are laterally. That is, while they are rarely to be seen in a straight line, or of even width, so in depth they are equally irregular. If one should thrust a staff into the surface of a ploughed field, the hard bottom would be found at depths ranging from one to nine inches, but very rarely nine. In the majority of cases, the plough is not to be blamed for this, but the ploughman. An American farmer, with any of our best standard American ploughs, can, if he will, do as good work as any English or Scotch farmer, with a Norfolk or Scotch plough. It is not altogether in the plough, although the Scotch plough, with its long sole and share, can hardly leave a right line in steady hands, but in the man, who has habituated himself, and has been encouraged to do so by force of circumstances, to plough carelessly or slovenly. New needs are now arising for our farmers. The original wealth of the soil has departed, and now the harvest, no longer bountiful as of old, must be secured by dint of hard-work and the best skill. And the first work toward this end must be done with the plough. It is not too much to say that we have yet to learn how to use this implement. To realize this, one should see the ploughing matches at the English Agricultural Fairs, or even those held so near to us as Canada. It is not so much the ploughing that one is struck with, as the system. The ploughing is perfection; a furrow half a mile long with equal width and depth, as measured with a rule, and straight as an arrow, and a land which looks, from the visitors' stand, like a row of parallel straight lines. But we see men who have given their lives to learn the art of ploughing, whose ancestors have been ploughmen for generations, and who are, therefore, born ploughmen. They are, moreover, taught to excel by a system of matches and prizes. Boys there compete with their ploughs, and are thus early trained in the way they should go, and the whole year is but a practising-time for the annual trial of skill. It is equally so among our neighbors, the Canadians, who have transplanted the old fashion from their native soils. On this side the line we have nothing like it Our boys have no ambition to excel. In this, as in other things, they are unwisely and unfortunately ignored; while the farmers themselves would rather see a horse trot in 2:40 than plough a furrow, at any time A plan to change all this suggests itself. Let ploughing matches be instituted at our Agricultural Fairs There is no possible difficulty. If the Autumn weather is too dry, let the competition take place at a more favorable season than our dry falls, but by all means let out farmers' boys have an opportunity to become ploughmen, and have some scope for their natural desire for competition, and to excel in the use of those implements by which they hope to, or are obliged to earn their bread. Our neighbors across the lakes hold, this fall, two such ploughing matches, at which $800 are to be competed for, while we, who are not willing to admit any foreign superiority, totally ignore these contests.—*Plantation.*

Grasses and Forage Crops.

Lucerne.

A correspondent writes to know—1st. How much lucerne seed should be sown to the acre? 2nd. Will it answer to sow it alone? 3rd. Is it what some people call French clover? 4th. What is your opinion of Bokhara (*Melilotus Alba*)? 5th. Will it pay to buy lime for 25 cents per bushel and haul it 10 miles?

REPLY.—If our correspondent will examine the article on page 75 of the present series of the CANADA FARMER, he will there find his enquiries, Nos. 1 and 2 fully answered.

To query 3rd we reply yes. It is also known as Spanish trefoil; and is said to be identical with the *alfalfa* of Mexico and Chili, which has for many years been used so successfully as a soiling crop in California. As regards the 4th question, Bokhara, tree-clover or Siberian Melilot, is a coarse erect plant growing sometimes to the height of seven or eight feet. Dr. Lindley, an excellent authority, speaking of this plant says: "It has been the subject of many trials as a forage plant in England, but has been found too watery when young, and too stalky when old." Its cultivation was also attempted in the neighboring States a few years ago, but as we hear no more of it, we fear it was not found a profitable crop. The answer to question 5th must necessarily depend upon circumstances. We have known instances in which a judicious application of lime on cold, stiff clay soils has increased the average yield from 20 to 30 per cent., while on the other hand, the same application to soil differently constituted, might have had a very different result. A perusal of the articles entitled "liming land," and "lime on land," on pages 33 and 74 respectively of the current series of the CANADA FARMER may perhaps furnish the key to a satisfactory solution of the problem.

Sewaged Grass and Hay-Making.

We should all feel much indebted to Mr. Morgan for his lucid, candid, and complete report. It confirms my own experience, that the sewage pure and simple should go to the land unprecipitated and unfiltered, except in such cases as Mr. Brown's practice of irrigation by very fine jets at frequent intervals.

My experience of making hay from sewaged Italian rye-grass is favorable. I once made in three days, and carted on May, 31, 3 tons per acre from sewaged Italian rye-grass. It should be cut at the right time of its growth, and carted when green, so that it heats, but not too much; and we have now the means, by Garrett's stack-ventilators and other processes. of regulating the temperature. It makes first-class hay for cutting into chaff, and I have never found much difficulty in converting it into good hay, provided it is cut at the right time, when the seed-head is protruded, and just before the blooming time. I am more and more convinced that the theory which I enunciated "that grass when cut for hay should be either flying through the air or be on the cock"—is a correct one. It should never be left spread over the surface of the land. My plan is this: if the weather is fine and dry, shake as you cut the first day; shake all the second day. Cock it at night, spread out the cocks in the morning of the third day, and on the same day cart it. Last year it rained every day for a week after cutting; we then set our shaker to work, cocked it at night, and carted it next day. Hay will make much better and quicker on the cock than on the rakerow or swathe. You thus avoid the night-dew and the dampness arising from the earth. The uncovered space between the cocks dries quickly, ready for their spreading out. For heavy crops the shakers should be made to revolve very rapidly, so as to pick up and disperse the crop quickly As a rule, shakers are not set to sufficient speed for heavy sewaged crops, so that horses are pushed beyond their regular pace. Unless the water is dried out of hay or clover, it will mould in the stack.

Last year our Clover, despite the frequent rains, was made properly, mostly by cocking and uncocking. A gentle heat takes place in the cock, which gets rid of much of the water. Any additional expense caused by cocking is amply repaid. When we look to profit rather than to cost, Mr. Gibb's excellent drying plan will become in use, also the box ventilators and fan draught. Too much now is left to chance. Good dry hay should be green. Our shaker immediately follows the cutter. We thus drive the grass through the air; Mr. Gibbs drives the hot dry air through the grass. His plan, with proper machinery and on a large scale, must be profitable. Dr. Voelcker pronounced the hay (made in 15 minutes by abstracting the surplus moisture) to be of the very best quality, and superior to slowly made hay long exposed. —*J. J. Mechi, Tiptree, March.*

Agricultural Chemistry.

Plants.

In the preceding articles on Agricultural Chemistry which have appeared in the CANADA FARMER, we have examined the composition of earth, water and air, and studied in a hasty manner the materials of which they are constituted. Now, earth, water and air form the food of plants, and it is from the substances that exist in the soil, and in the atmosphere that they are built up.

We shall expect, therefore, to find in plants the same constituents as we have already found in the soil and the atmosphere; and this is really the case.

Fresh green plants contain a large quantity of water. This may be driven off by drying them in an oven. Meadow grass contains about 72 per cent. of water, turnips about 91 per cent. pine wood about 40 per cent. But even in *dry* plants, such as hay and seasoned wood there is a considerable per centage of water. Thus hay contains about 15 per cent. of water, and seasoned pine wood about 20 per cent.

The water that is found in fresh plants, is present in large quantities in the juice and is expelled by simply drying in the air. Part of the water, however, constitutes an essential part of the tissues of the plant, and cannot be expelled without the aid of heat. Water, then, constitutes from 40 to 90 per cent. of green plants, and from 12 to 20 per cent. of dry plants.

The other constituents of the plants are partly *organic* and partly *inorganic*. *Organic* matter is produced by the vital growth of the plant. It is generally combustible and may be burned away, what is left forms the *inorganic* part, or *ash* of plants.

The organic part of plants, consists chiefly of woody fibre, starch, sugar and oils, which consist of carbon, hydrogen and oxygen; and of a group of substances containing, in addition to these elements, nitrogen, as well as a little sulphur and sometimes phosphorus, to which the name of the *albuminoids* has been given, from the similarity of their composition to that of albumen, or white of egg, an important ingredient of the animal body.

Woody fibre is the substance which forms, as it were, the skeleton of plants. It forms the walls of the cells, tubes and fibres of which the plant is built up. Cotton and hemp, white cloth and paper are examples of nearly pure woody fibre. Skeleton flowers and fruit are made by dissolving away all the soft parts of the plants and leaving the framework of woody fibre which gives form and consistence to the whole. Starch occurs in the seeds of grains, in the tubers of the potato and in the pith of trees, as in the sago palm and in other situations. It occurs in the form of minute granules which are packed in the interior of cells. Wheat flour contains about 65 per cent. of starch, dried potatoes about 62, while clover seed contains only about 11 per cent.

Starch is insoluble in cold water, but by the action of various substances it can be converted into sugar, and then becomes readily soluble. This always takes place when seeds begin to germinate—the sugar so produced being dissolved by the growing plantlet is applied by it to its own nourishment. In the operation of malting the grain is allowed to germinate until the starch which it contains has been converted into sugar, and then the young plants are killed by exposure to heat and the sugar so formed is dissolved out by water.

Sugar exists in various parts of plants, as in the juice of grasses, and in that of the sugar maple, and the beet root. Varieties of sugar known as grape and fruit sugar, are found in the pulp of different fruits. Sugar is also found in the germinating seed. After being taken up by the young plantlet it is converted by it into woody fibre and becomes part of its tissue. Thus we see that the plant has the power of converting starch into sugar, and sugar into woody fibre. All these substances contain carbon, hydrogen and oxygen.

Fats and oils are very important substances and are found in most parts of plants, but occur in the greatest abundance in certain seeds. The grain of of wheat contains 1·6 per cent. of oil, but wheat bran contains 4½ per cent. Peas contain 3 per cent. Indian corn 5 and oats 5½ per cent. while flax seed contains 34 per cent. of oil.

Certain oils contain phosphorus. The oil of the pea contains 1·17 per cent. of this substance; that of wheat about ¼ per cent. There are certain animal fats of the same composition; a compound of this nature exists in the brain.

The albuminoid substances differ from the preceding by containing nitrogen. They are identical with similar substances which form a large proportion of the animal tissues. They are *albumen*, which forms the white of egg and is found in the serum of the blood; *fibrin*, which constitutes the fibres of muscle or flesh; and *caseïn* or the curd of milk. Bodies similar in composition and properties to these three substances are found in vegetables. Vegetable albumen occurs in the juices of plants. Vegetable fibrin is found in *gluten*, which in an impure state constitutes the sticky substance left behind when the starch is removed by washing from flour. A substance having a similar composition to caseïn, is found in the pea and bean. Indeed a kind of cheese is made in China from peas and sold under the name *Tae-foo*.

The substances which make up the organic part of plants may be divided into two classes. Those which contain nitrogen and those which do not. The first class contain carbon, hydrogen and oxygen. These elements are absorbed by the plant in the form of water and carbonic acid. Sugar, starch, and woody fibre consist of carbon united with hydrogen and oxygen in the proportion in which they exist in water. Hence when the plant absorbs carbonic acid and water, and these substances are converted into the tissues of the plant, there is a certain amount of oxygen over and above what is wanted, and this is set free and exhaled by the plant. Thus we see that the plant has the power of absorbing mineral substances and changing them into its own proper tissues. This wonderful change only takes place under the influence of light. Hence during the day time plants are always absorbing carbonic acid and giving off oxygen. When we recollect that animals are giving off carbonic acid and absorbing oxygen with every breath that they draw; and when we consider that while oxygen is the very vital breath of animals, carbonic acid is to them a deadly poison, we cannot avoid being struck with the beautiful manner in which the animal and vegetable kingdoms are adapted to each other, the one drawing nourishment from that which the other rejects, and which in the case of carbonic acid is to the other a fatal poison.

In the night, plants cease to absorb carbonic acid, and even give off a small portion of that which they have previously absorbed.

Over-Liming.

There is a curious condition of soil which is brought about by the frequent repetition of large doses of lime applied as a manure, which is usually spoken of as the result of over-liming. The effect of such an over-dose of lime on the land is to loosen it and take away from it its firmness. Even stiff soils become open under large and repeated additions of lime, and become reduced to such a condition that wheat cannot be raised on them with any certainty of obtaining a good yield. Lighter soils, especially when they abound in vegetable matter become so much loosened under these circumstances that the foot sinks in them. In these over-limed soils oats and clover cannot be made to thrive, though barley and turnips often do well in them. Why is it that oats and clover refuse to grow on these soils? Is it because the quantity of lime in them is too large for the healthy development of these crops? *Is it* the excess of lime in the soil that acts injuriously on them and checks their growth? Apparently not, for analysis shows that *in soils of this* kind where neither oats nor clover can be grown, there is really not more lime than is usually present in fertile soils. Sometimes there is not even so much as is generally found in land which bears large crops of oats and clover.

Barley and turnips flourish in a light open soil, oats and clover, on the contrary, need one which is comparatively firm Hence it appears probable that the action of the lime in unfitting the soil for the latter consists in its mechanical effect of breaking down and loosening the soil. This view of the case is confirmed by the fact that such light and open soils can be made to grow oats by anything which consolidates them, such as their being turned into pasture-land for some years, or when they have been put in turnips and the turnips eaten off the land by sheep.

These facts point conclusively to the opinion that it is the mechanical effect of the lime on the soil and not its chemical action on the plant that produces the peculiar effects of over-liming; and the remedy at once presents itself of endeavouring to consolidate the soils, either by the roller or by the fat of the animals, or else by putting clay, gravel, or some such heavy material, on the land, or bringing up the firm sub-soil from beneath.

An ingenious theory has been advanced to account for this injurious action of lime on soils.

The *rising* of dough is caused by a process of fermentation set up by the yeast which is mixed with the flour. One of the products of fermentation is carbonic acid, and this carbonic acid being disengaged in all parts of the dough, causes an innumerable quantity of bubbles to form in the pasty mass, which consequently swells greatly and becomes extremely porous. It is upon this escape of carbonic acid that the lightness of bread depends. Bi-carbonate of soda and tartaric acid are sometimes used as a substitute for yeast in making bread. These substances are mixed with the flour and have no effect on each other in the dry state. When, however, the water is added, the tartaric acid displaces the carbonic acid in combination with the soda and sets it free. The carbonic acid at once assumes a gaseous condition and escapes, producing the same porous condition of the dough as in the former case.

Now lime is very frequently added to the land as carbonate of lime, and in whatever condition it is added it is usually converted sooner or later into carbonate. Soils containing much decaying vegetable matter very frequently contain a considerable quantity of acid which has been formed during the decomposition of this vegetable matter, and this acid acting on the carbonate of lime will displace the carbonic acid and set it free exactly as the tartaric acid sets free the carbonic acid in the dough.

It is quite conceivable that this carbonic acid, liberated gradually within the soil, would break it up and cause it to assume a porous condition just as it causes the dough to rise under similar conditions.

An experiment quoted by Liebig seems to favor this view. In this experiment which was performed by Kuhlman, one meadow was manured with quick-lime, one with chalk (carbonate of lime), and a third left unmanured. That manured with quick lime gave an increase of 3,00[illegible] kilos. per hectare over that left unmanured, while that manured with chalk showed a decrease of 556 kilos. each year. The only difference between chalk and lime is the carbonic acid which the latter contains, and since lime alone was beneficial, it would appear as though it must have been the carbonic acid which produced the injurious effect. Little reliance, however, can be placed on the result of this experiment as a means of forming a judgment on this question as we do not know the nature of the soils experimented with.

Whether this explanation be the correct one or not, it is at least a plausible one, and one which seems to agree fairly with the facts as far as they are known. At any rate the remedies already pointed seem to be those which are most likely to meet with success.

Entomological Department.

Prize for Insects.

The Royal Horticultural Society (England), offers a prize of $50 for a collection of British insects injurious to some one order of plant used for food, such as *cruciferæ* (cabbage tribe), or the *leguminosæ* (bean tribe), etc.—the collector to be at liberty to select such tribe of plants as he chooses. The insects to be exhibited in their various stages of development, accompanied by specimens, models, or drawings of the injuries caused by them.

An Insect Show.

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

Insect Pests.

The worst enemies of the naturalist and taxidermist are two species of beetles, the *Dermestes* and *Anthrœnus*, which in their larval state, in the form of worms covered with hairs, commit great ravages wherever there is any animal substance. The skins of birds and animals are quite destroyed before their attacks are suspected. The ligaments of small skeletons, horns, and hoofs soon show the presence of these animals by the dust which falls from their gnawings. Whole collections of insects are reduced to dust-heaps in spite of camphor, tobacco, and similar substances. The only way to kill them is by baking the specimens which contain their eggs above 160° Fah., which will coagulate the albumen and destroy them. To prevent their attacks, skins and ligaments should be thoroughly poisoned with arsenic, and insects should be hermetically sealed.—*Journal of Applied Science.*

Fumigation for Plants.

Mr. J. C. Niven, of the Hull Botanical garden, recommends tobacco fumigation (in London *Garden*) for cleaning green flies from certain house plants infested by them. His plan is to lay the plant on its side in a wash-tub, throw over it a damp towel, or better, "a bit of glazed calico lining," and then, through an opening at the bottom, have "your husband" insert the end of a pipe, and through it let him blow tobacco smoke until the plant gets a good fumigation. The flies will be found at the bottom of the tub when the operation is finished. The plants should be perfectly dry when the operation is performed, but if a towel is used it should be freshly washed and wrung out before using, and be without holes. The pipe stem should reach to the bottom of the tub. As to the husband, if the owner of the plants hasn't got one, a substitute will answer—the point being to effect the fumigation thoroughly.

Remedy for the Striped Bug.

Some weeks ago I saw, in the *Farmer*, a recommendation of the use of ground or calcined plaster as a remedy for striped bugs. My own experience allows me to tell you how I have improved on that remedy. Having occasion to use Paris green and calcined plaster, in proportion of one of the former to fifteen of the latter, as a destroyer of the potato bug, I tried the stuff on squash, melon and cucumber vines; with me, the mixture dusted on from a common dredging box, has proved equally effectual against the Colorado potato beetle and the striped bug. On squashes of the tenderest variety of foliage, like the Hubbard, for instance, and on the hardier, like Cymlin and the winter Crookneck, this mixture, put on while the plant is wet or dry, does not injure them, and so of musk melons and cucumbers. The water melon, however, does not bear such treatment, and I recommend that the mixture be used with care. I give my experience in this business—limited as it is—because I know with what extreme difficulty cucumber and other vines are protected from the striped bug.—*Cor. of Prairie Farmer.*

The Pests of Rosebushes.

These are abundant enough, as every one who has tried to cultivate roses knows, unless the experiment has been made in some region exceptionally free from the ills to which these shrubs are heir. Bugs and worms, and flies, too, often cover the bushes, and it is impossible to give infallible directions for their extermination. One cultivator uses carbolic soap with success, while another does better with whale oil soap, and still another accomplishes wonders with tobacco smoke. All the dealers in seeds and horticultural supplies keep the soap and the oil on hand, and tobacco can be had in large quantities at a cheap rate. Perhaps as effectual a method as any is found in the combination of tobacco smoke with either of the other two agents, the washing being done either before or after the smoking. Now, the smoking, although it is very easy to talk about, has its drawbacks. If, however, it must be done, it is well to do it effectually.

We have seen a device which, so far as the production of smoke goes, is very satisfactory. A common tin box, such as dry mustard is sold in, is taken to the tinman, who cuts a hole about half an inch across the bottom, and solders on a tapering tube, something like the nozzle of an oil can. In the cover of the box he cuts another hole, and solders on a tube flaring slightly outward, of a size to fit over the nozzle of a pair of bellows. The whole machine looks like one of the affairs which dealers in magic cock-roach powders sell for the purpose of blowing the powder into cracks and crannies. The box is filled with tobacco, and a live coal inserted just under the cover. The tube is then placed on the bellows, and the latter put in operation. The result will be a smoke such as no respectable insect will endure for a moment.

It is quite practicable to smoke plants, both indoors and out, by using a light frame covered with glazed cloth, or other reasonably smoke-proof material. This is made large enough to put bodily over the bush. The nozzle of the smoke bellows may then be introduced through a suitable aperture, and in a few minutes, or seconds, the smoke inside will be almost thick enough to cut with a knife.—*Ex.*

Horticulture.

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

Forest Tree Planting.

Transplanting Evergreens.

The frequent enquiries which we have on this subject induce us to give somewhat in detail the information which we have furnished on former occasions, with such additional suggestions as a good deal of experience enables us to make. Small evergreens from nursery rows are most conveniently transplanted in spring, but trees of considerable size from the borders of woods, or from plantations which require thinning, are successfully removed in winter—sometimes to better advantage than at any other time—when they may be drawn on snow or frozen ground, or when the surface of lawns is not cut by wheels or the tread of horses.

Evergreen trees should never be taken from thick woods, as the shade and shelter have unfitted them for the exposure of sun and wind in the open ground. The only exception is perhaps in cases of small trees which are removed to the nursery row or bed, and sheltered until they have become hardened to open ground. But those which grow in thin plantations, or along the borders of denser woods, may be set out in open grounds with little difficulty. If the surface has been kept from freezing to much depth by a few inches of snow or by a coat of forest leaves, the work may be done with great facility. There is one difficulty, however, connected with setting them out again—a hard frozen soil at the place of destination. The holes should have been dug in autumn, but if this has not been done it may be still accomplished, although with additional labor, which will be less according to the thickness of the stratum of snow. In some instances, where large masses of earth have been secured with the roots, in a circular flat form, (fig. 1,) we have found it convenient to place them upright within a few feet of the place where they were to stand, and allow them to remain on the surface till the ground was open in spring. When there was enough earth on the roots to retain them upright in their places (fig. 1,) all have lived and grown with little check—even those which are commonly found difficult to transplant. Removing them with denuded roots will certainly result in failure, even at favorable seasons of the year. Some years ago, we had occasion to set out a dozen white pines, from six to twelve feet high. Every one was secured with a ball or flat mass of earth, large enough to keep the trees upright. A neighbor, who also desired a few trees of the same kind for his grounds, expressed his contempt at the pains we had taken, and said he would take up a hundred in the common way, and if some died he should still have plenty. He went with a team sufficient to draw the whole, tore out his hundred trees, and set them in his grounds. Only one, a small one, lived, and grew feebly. Of the dozen which we secured with masses of earth, all lived and grew vigorously.

FIG. 1.

It sometimes happens that fine evergreen trees grow along the borders of woods and swamps, where they may be easily secured. The earliest and most successful experiments we ever made in removing evergreens, were in such localities, the trees standing in black muck, which was only a few inches deep over the hardpan. Cutting a circle about them with a spade, under the protecting stratum of snow, they were readily loosened; and by attaching a rope with sacking to the stem at the surface of the earth, they were at once drawn in a standing position, upon inclined plank and placed on a sled by the team hitched to the rope. The size of the circular mass of earth was about two feet in diameter for trees seven or eight feet high, and three feet in diameter for trees ten or twelve feet. Such trees never failed to live and grow well.

When evergreen trees stand too closely together on the grounds of the owner, they may be thinned out to great advantage by removing them to other localities, where they are wanted. The transplanting succeeds best if a circular trench is cut about them one year before (fig. 2.) shortens the long roots and brings out new fibres, as shown in fig. 3 and 4—the first showing the roots before or at the time of shortening (the dotted circle the trench); the second, the appearance of the dense roots after one or more season's growth. This is not necessary, however, for trees of moderate size, the trench being cut about them in the same way in either case. A simple mode of lifting out the tree after the trench is dug, was shown in a former volume of the *Country Gentleman*, and is represented in fig. 5. An excavation is made somewhat under the tree on one side, for the insertion of the lever. For this, an oak or other stout scantling may be used, of a size corresponding to the size of the tree, the larger ones requiring a piece 16 feet long, and 4 by 6 inches square.

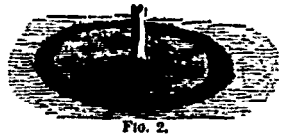
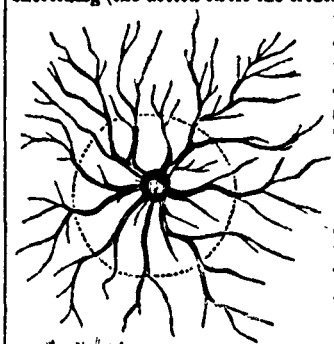


FIG. 2.



FIGS. 3 & 4.

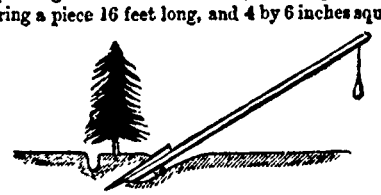


FIG. 5.

Place the lever in position, as shown in the cut, and on the top insert a wedge or stout iron bar, driving it with a sledge well under the tree. Then raise the lever, block under it for a fulcrum, and bear down on the lever, and the tree is lifted out. The tree may be then carried by men to its place, drawn on a stone boat, or if the distance is great, placed on sled in the manner we have already described.

FIG. 6.

Another mode of removing large trees is shown in fig. 6, by which trees twenty feet high have been successfully transplanted, and the work may be done in winter, when there is but little snow, or at any time in spring, although the surface of the earth is less cut or injured while frozen. The tree is first dug and completely loosened. Old carpet or sacking is then wound around it near the earth, to prevent bruising the bark. An iron ring five or six inches long (fig. 7,) is then fastened to the trunk by passing stout sacking several times through it and around the trunk, as shown in fig. 8.

FIG. 7.

The hinder wheels of a common farm waggon, detached, are then backed up to the tree, and the pole, b, fig. 6, with a chain and hook, is attached to the ring, and the tree hoisted out of the hole. A horse, hitched to the whiffletree, a, draws it off, a man holding the pole to keep the tree steady. When it reaches the hole intended for it, it is dropped in by raising the pole.

FIG. 8.

FIG. 9.

FIG. 10.

Small trees, furnished with limbs down to the surface of the earth, cannot always be easily dug around, with the branches thus in the way, fig. 9 It is well, in such cases, to bend these branches upward and secure them by a cord or strap with buckle, as shown in fig. 10.—*Country Gentleman.*

Recent French Discoveries.

The following is a translation from the *La Bien Public*:

"A discovery curious enough has been made recently. An agriculturist has observed that by watering vegetables and fruit trees with a solution of sulphate of iron, the most astonishing results are obtained. Beans have gained 60 per cent. on their ordinary size, and, what is better, their taste is much more savorous. Among fruit trees, the pear tree is most benefited by this process of watering."

Again, the *Revue d' Economie Rurale* announces that a new process of early vegetation has been tried with the greatest success, by a horticulturist of Chatillon, France, who, besides the heating of the interior air in the greenhouse (hot-house), heat also the earth itself, the hot-bed on which the plants grow. For this, he establishes, at a certain depth, pipes through which steam circulates constantly. The steam penetrates the interior of the earth by means of valves opening from place to place. Such pipes are from 5 to 10 centimetres (2 to 4 inches) in depth, by the side of the plant beds of strawberries, flowers, and "grammeces;" from 15 to 20 centimetres (6 to 8 inches) for fruit trees. The earth thus artificially heated produces vegetables and fruit with an economy of half the time necessary when the interior of the greenhouse only is heated. Thus every one could see at this agriculturist's early in April, strawberries that had blossomed, formed their fruits and ripened in fifteen days; violets that had developed their flowers in ten days; asparagus and artichokes which have been grown and been gathered in thirty-five days.

Finally, within only forty-five days dwarf cherry trees have budded, blossomed and brought forth fruit in a perfect state of ripeness. This wonderful process of early vegetation is new as to its application to gardening. But it is taken from nature. It is well known that in several thermal stations, and especially at Aix, in France, the gardens which are near or above the thermal fountains, produce early fruits and vegetables (primeurs) in winter—the earth being heated by water-steam, the heat of which rises to 80 degrees centigrade.

Garden Lawns and Croquet Grounds.

A good close velvety turf is one of the most ornamental objects a dressed ground can boast of, and oftentimes the most difficult to obtain. The following suggestions, based on many years' practical experience, are therefore offered:—

"In the first place, careful preparation of the ground proposed to be laid down to turf is necessary. This should be commenced in the winter by draining, if found requisite, and digging to the depth of 6 to 12 inches, according to the nature of the soil When this has been done, the land should be levelled and made firm with a spade, and subsequently raked, to remove stones, &c. Should the natural soil be too stony, it will be advisable to procure a supply of good mould, and spread this over the land to the depth of 2 or 3 inches. If the soil is poor, some well-rotted stable-dung will be very beneficial. Where this cannot be obtained, we would advise as the best dressing of artificial manure, 2 cwt. of super-phosphate of lime, and 1 cwt. of Peruvian guano per acre. In March, after the ground has been made thoroughly fine and clean, a heavy iron roller should be used to make it perfectly level, and as the subsequent appearance of the lawn depends in a great measure on this part of the preparation, we cannot too strongly urge the importance of its being well done. The ground should then be evenly raked, and the seed sown. April and September are the best months for sowing As to the sorts of seeds suitable for garden lawns, &c., we can, after a long course of personal observation of the numerous kinds which have come under our notice, confidently recommend the following varieties as most certain to produce a close velvety turf:—

"Cynosurus cristatus (Crested Dogstail), Festuca ovina (Sheep's Fescue), Festuca ovina tenuifolia (Fine leaved Fescue), Lolium perenne Suttoni, (Suttons' Dwarf Perennial Rye Grass), Poa pratensis (Smoothstalked Meadow Grass), Poa nemoralis (Wood Meadow Grass), Poa nemoralis sempervirens (Evergreen ditto), Medicago lupulina (Yellow Trefoil), Lotus corniculatus (Birdsfoot Trefoil) Trifolium repens (White Clover), Trifolium minus (Yellow Clover).

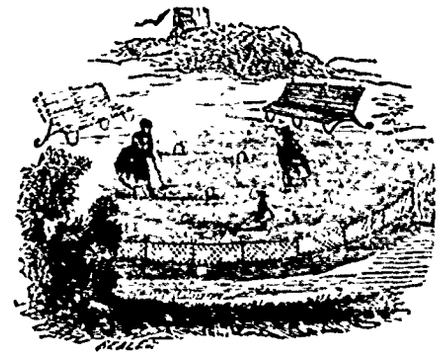
"These should be mixed in their proper proportions, and sown at the rate of 3 bushels or 60 lbs. per imperial acre, or 1 gallon to 6 rods or perches. After the sowing has been accomplished, the ground should be again rolled, and as soon as the young plants have attained the height of 2 or 3 inches, the whole plot should be carefully gone over with a sharp scythe. Frequent mowing and rolling are indispensable to maintain the turf in good order. By adopting these means, a close green sward will be obtained in nearly as short a time as a lawn produced by turfs, while it will be far more permanent, and of much less expense.

"It will sometimes happen that annual weeds indigenous to the soil spring up; these can easily be checked, if not destroyed, by mowing them off as soon as they make their appearance. Plantain, dandelions, and daisies, too, will often appear, and these must be cut up each one singly about an inch below the surface (not deeper), and about a teaspoonful of salt dropped over the cut part.

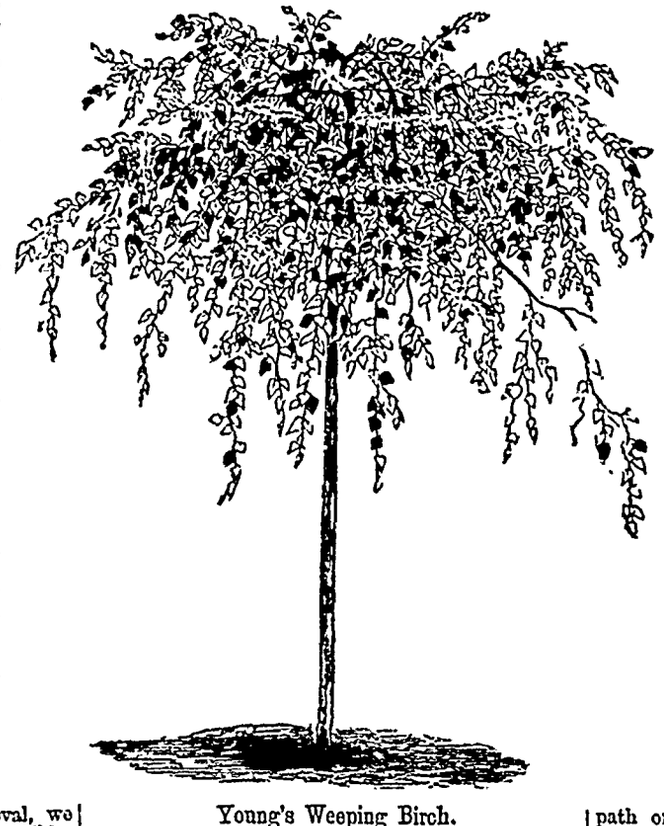
"For lawns requiring improvements, it is only necessary to sow fresh seed, either in the spring or autumn, using a small tooth rake and rolling afterwards. Moss in lawns is generally a sign of poorness in the soil, or a want of drainage; to effect its removal, we advise, after raking off as much moss as possible, a top-dressing of quick-lime mixed with rich compost, applied in the winter, and a sowing of more seed in the spring, or a top-dressing of soot will, by encouraging the growth of grass, destroy the moss. This should be applied in the spring, at the rate of about 16 bushels per acre.

"On croquet or cricket grounds, where the turf has become bare through constant use, we advise a thick sowing of seed on the bare spots in September, or early in March, rolling subsequently, and mowing as soon afterwards as practicable. A slight dressing of manure over the whole playing square during the winter will often be found beneficial in encouraging the growth of finer kinds of grasses, and help to produce a close-growing turf. We should not omit to mention that here, as in fine garden lawns, mowing alone will not ensure a good bottom without that compression which a roller alone can give."

In order that our numerous readers may more fully appreciate how these things are done in modern times, we take the liberty of presenting illustrations of the croquet ground with its appurtenances of fence and seats:—



Why not, we say, have these grounds in as excellent a state as a bowling green or well-kept lawn? They offer the most agreeable pastime to the greatest number of those inhabiting villas. No game is more thoroughly appreciated by the ladies, and some of them are adepts at the mallet. It is a thoroughly unselfish game, too, as both sexes can mingle freely in it. We are sure, therefore, our readers will look into this matter with more than ordinary interest, and they will be all the better for digesting the eminently practical remarks above given, bearing upon the proper formation of lawns, learning what to sow and how and when to sow it, how to repair injured lawns, and when and how to repair them.—*Sutton's Amateur's Guide.*



Young's Weeping Birch.

The Florist and Pomologist for March, gives the following description of this new, hardy, drooping tree. "We have seldom met with a more remarkable and characteristic hardy deciduous tree than that now represented, nor one more worthy of being planted in any situation where an ornamental tree could be properly introduced. To the airy lightness and graceful elegance of the Birch in its normal character, this Weeping Birch, called *Betula alba pendula Youngii*, adds the grotesque peculiarity which characterizes the growth of the Weeping Birch, since its main branches often start up at random in an erratic sort of way. Thus the tree acquires a peculiar and distinct aspect, in which gracefulness is singularly combined with a certain weird-like picturesqueness.

"We learn that this ornamental variety of Birch was found growing in a wood in Hampshire, about twenty-five years ago, by the late Mr. W. Young, of the Milford Nursery."

The accompanying engraving is of a young tree, which can give our readers only an approximate idea of the beauty of fully developed specimens. In older trees the pendent twigs are often nine feet in length, and not thicker than fine string.

"As a weeping tree of a distinct type, this Birch cannot be too highly recommended. It has a peculiar and somewhat erratic style of beauty, no two trees being alike in habit. In its younger stages it often presents a rotund outline, but as it gains age away starts a leading shoot, which 'groweth where and how it listeth,' sometimes taking on one form, sometimes another, sometimes running up quite slender and fountain-like, and sometimes stretching out laterally, as if determinedly opposed to symmetry, and defiant of control. The spray is remarkable for its long, slender, thread-like character, falling sheer down in tufts, many feet in length, from the main branches which give it support, and when gently swayed by the summer breeze these leafy streamers have a peculiar lightness which no other similar tree possesses."

Planting Flower Beds.

There are two distinct modes of furnishing beds with flowering plants. One is, to plant in each bed only one kind of plant; another may, for distinction, be called the mixed style. The former style ensures a bold and decided piece of coloring, for a short period of the year, rarely exceeding three months, the latter style secures to the amateur a constantly changing source of pleasure for at least seven months out of twelve. It consists in the judicious distribution of plants of all kinds over your beds and borders, in such a way that as month after month calls fresh sorts into bloom a pleasing effect is maintained. This end may be obtained either entirely from hardy perennials, which, for those who cannot spare much time for gardening, afford the greatest pleasure and variety for the smallest amount of care and attention; or from a mixture of spring flowering and autumn flowering perennials with summer flowering annuals and half-hardy plants. In very small gardens, it will be advisable to keep only one plant of each kind; but where space permits, a better effect is often produced by planting three of a kind in a group, so that when grown they may look like one good sized plant.—*Gardener's Chronicle.*

Ingenious Glass-Houses.

In February last we visited the nursery of Thomas Meehan, at Germantown, Phila., and after looking over his fifty acres of young trees, shrubs, hedgeplants and herbaceous flowers, we were introduced into the glass-houses, which we found full of choice exotic plants in great variety, and many in bloom for furnishing cut flowers. The two houses are in one under the roofs, and upon the famous plan of P. Henderson's, in Bergen, N. J. They are a hundred feet long, and each is thirteen feet wide, or twenty-six feet is the width of both. They are built upon a natural slope and terraced inside. Terrace No. 1 is under the front table of front house, thirty inches broad, and upon this the earthen *cans* or *flues* are laid its whole length. No. 2 is a foot higher, and forms the path or gangway. No. 3 is three feet higher, supported by a stone wall, is level and nearly five feet broad. The same level runs through to the path in upper house, which is a foot higher, and is No. 4 terrace. No. 5. is the same as No. 3 in front house. The ground outside is nearly level with the top of back wall; and as the houses face south south-east, they are sheltered, all but the roofs, from north north-east. In outside appearance, the rear house is looking over the top of front house. The whole is heated by the single row of earthen pipes as flues laid upon terrace No. 1, through which the smoke from the fire passes. By a careful estimation, only a half ton of stone-coal was used each week, in the severe weather during past winter. No one will be surprised at that, who sees how snugly the houses are imbedded in the ground. There is no damp—the under stratum is slaty rock; all the water from rain and snow is conducted from the roofs into a sunk cistern inside the houses, and suffice for watering all the plants.—*Practical Farmer*

THE KITCHEN GARDEN.

The Best Two Potatoes.

In reply to our correspondent H Biddle, which two potatoes we recommend as the most profitable for market, we reply, that with some fruits and vegetables the two best, and the two best for market, are not always synonymous terms; but in the case of two potatoes we think they are Early Rose for best early, and White Peach Blow for best late. These, in our opinion, are not only the best, but also *sell* the best. Much was expected from the Peerless, but in this section, within our observation, it has not come up to expectation. Very productive, but of poor quality, and in many patches we visited last fall, it seemed to have been especially attacked by the potato bug, and almost rendered unsaleable by its partially eaten surface. As a table potato it is quite sodden and watery. It will not command the highest price.

The Early Rose is a really good potato, both for summer and winter, is very productive and very early. It can readily be got off and marketed, leaving the ground vacant for a good crop of winter cabbage or other crop. The White Peach Blow is our finest late potato, and brings the best price for family use. In boiling, it should first have a paring taken off around its circumference. It is especially dry and mealy, and if there is such a thing, it has a real potato flavor. We have heard connoiseurs in good things speaks of a roasted Peach Blow potato as the finest kind of eating. It has one drawback of continuous growing till late in the fall, (thus preventing putting in another crop). It also makes an enormous growth of top. It is, however, quite productive, and always is in demand in Philadelphia for storing away for family use till potatoes come again.—*Practical Farmer.*

Seed Sowing.

I can easily understand why a large quantity of seed sown never grows, and consequently has a tendency to discouragement. The seedsman generally is blamed; but this is a mistake, for bad as is the seed frequently sold, it must be borne in mind that if only one-half germinates, there is more than enough for one's use. The cause of failure is sowing too deep, and actually burying the seed. In a state of nature all seeds germinate on the top of the ground, protected with a slight covering of fallen leaves or blades of grass. There is a golden rule to guide us in sowing seed, and that is, never to cover it with a greater thickness of soil than the diameter of the seed itself. There are of course exceptions; but in sowing radishes for instance, the ground should be forked or dug level. The seed should be sown, and if a shower of rain falls, nothing more is required, as it will break down the rough ground sufficiently to cover the seed. In the absence of rain, you may use an ordinary wooden hay-rake to chop the soil—not to rake it as a person would a turnpike road; nor must you confound the wooden rake with the ordinary iron rake. The latter I consider one of the most dangerous tools in a garden, and, as a six-tined steel fork is now being manufactured, the iron rake ought to be condemned altogether. Now, many amateurs suppose that rakes are for the purpose of clearing the ground of stones, the very pores of the soil by which light, heat, and moisture reach the roots of all plants. The consequence is, you have a surface washed flat by the rain and baked hard by the sun, and, as the soil so cultivated is sown, and consequently cannot be disturbed, it becomes an eyesore for months "But," my friends say, "if I were to adopt your advice, and not cover up the seeds, I should have no crop at all, because the birds would take them" Now there is only one effectual cure against small birds. You may build up dummies, put cross-lines of feathers, stick feathers in oscillating turnips, resort to stuffed ferrets or cats; and all to no purpose, as the birds, after a short consultation, will know that neither of these experiments is any trap at all But they will never approach black cotton, which must be stretched in lines across the part sown about two inches from the ground, and, with all the craft of sparrows, they will never allow themselves to get entangled in cotton.—*The Gardener's Magazine.*

Horse Radish.

James Barnes, in the *London Garden*, gives the following account of a horse-radish bed: "What brought horse-radish into greatest notoriety was, however, the following circumstance. Between fifty and sixty years ago, in Gray's Inn Lane, was a vast mountain of years and years accumulated London cinder-dust, filth and garbage, yes, a real mountain of it; and amongst its vast and varied accumulations were immense plants of horse-radish, growing right up through the whole, the produce probably of crowns cast from scullories to the dust-bin. Here it found a favorable site; and as the mountain increased in size and height, so did the horse-radish, with its great strength and spear-headed crown, continue to thrust itself through it. Enough at least did so to create astonishment in those days, and to bring the horse-radish into prominent notice, for when this mountain of refuse was removed, the immense length and size of the horse-radish roots were discovered. We had no horticultural journals in those days; but the *Times* and the few papers we had, prominently adverted to this wonderful horse-radish, and related how and where it grew. It was, indeed, a real phenomenon, the leaves being as large and thick as those of a banana, while its roots were as large and long as scaffold poles How many hundred weight a root of it weighed, it would be difficult to guess, yet one root, as large as a farm-yard gate post, was dug out and exhibited. The publicity thus given to the matter, and the extraordinary perfection the roots attained in so rich a pasture, proved how simply horse-radish can be grown, and induced everybody to cultivate it in earnest."

Paraffin and Peas.—At this season of the year it may be of interest to many of our readers to know that before sowing their garden peas, if they mix about a tablespoonful of paraffin oil with a quart of peas, turning them about so that all may get a taste of it, not a mouse will touch one of them, and the peas will not be injured in the least by the paraffin. —*Garden.*

Hoeing up Cabbage.—John Price, in the *Gardener's Magazine* (English) says.—"The grand secret of cabbage-growing is to continually stir the ground, but to keep the earth away from the stalk." We think that it has taken the American gardener much less time to learn that secret, than it has the English gardener to *unlearn* the old notion of earthing up most garden vegetables.

Asparagus and Manure.—I have tried all kinds of manure for asparagus plants, and all sorts of treatment. Nothing, however, produced such a rank and thick growth, as fresh cow manure. We have often used horse manure, well rotted, and salt and various other applications. But the pure cow manure, spread over the bed about three inches thick, proved the best. The year before last we had the most wonderful growth, and as we believe, entirely from this cause. We always leave our stalks until they are about one foot high before cutting them; we fancy they are much better, and we know we get three times as much vegetable food fit to eat.—*Exchange.*

THE VINEYARD.

Injured Grape Vines.

The severity of the past winter in Iowa, has occasioned much anxiety among fruit growers; and the following letter from Mr. Muench to the *Rural World* calls particular attention to the grape vine. We shall be glad to receive items pertaining to this and other fruit matters, from our readers and correspondents. I would call on my fellow-citizens to closely examine their grape vines. They will find, to their mournful surprise, that our prospects for the next grape crop are very gloomy. It was just ten years ago that, by extraordinary severe frost on New Year's day, our vines were killed right down to the snow line; and the effects of the frost in December and January last proved to be hardly less detrimental. I would caution my friends against using any bit of such vines as have remained above ground, for cions and cuttings, as very little of the last year's growth is really sound. The Catawba, and other vines of a more porous wood, are dead to the ground; others lost their main buds, and show a sign of life in one or both of the secondary eyes, and the wood itself in most of them has the appearance or paleness of oath. After removing the outer bark of the last year's canes, the denuded stem, if sound, will be of bright light green color; while the injured wood and cambium show a dirty hue, between gray, yellow and brown. The Cynthiana has stood the cold spells better than the Norton; the Concord better than the Martha and all Rogers' and Arnold's hybrids; my Louisiana seedlings and the Neosho better than any of all the others. Upon the whole, I count on a very scanty crop, except from regularly covered vines.

The failure, lamentable as it is, ought not to operate as a discouragement. Complete or partial failures will occur in most of the wine regions; indeed, more frequently in the most famous grape countries than with us—and we must try to do better next time. Those who cannot bear a disappointment had better root out their grape vines forthwith.—*Iowa Homestead.*

Grape Cuttings—How to Grow.

I usually make them so that their length will vary from three to five buds, then bundle and place them in a pit, cover with about a foot of dirt, and let them remain until the following spring. It is not material with me whether the buds are uppermost or placed in the pit horizontally. When planting out cuttings, I place them in rows from east to west, with the tops pointing southward. The lower portion of the cuttings is to be placed in a position that is nearly horizontal, while the upper portion is to be set in the usual position. Between the first and the eighth of June, I set crotches from ten to twenty feet apart, which are from four to five feet in height from the surface; on these lay poles, and against them set brush to form a partial shade for the cuttings; let them remain in position until about the twentieth or twenty-fifth of July, when, if a rainy day occurs, remove them entirely.

I have had the best of success with the most difficult kinds of cuttings to propagate, Norton's Virginia, Delaware, Cynthiana, Herman and others. In the old way of planting and cultivating, I usually lost about forty out of every hundred cuttings, while, by my present plan, I save and get a good growth on ninety out of every hundred cuttings.—*Rural World.*

Strawberry Fertilizer.—In answer to an inquirer, *Colman's Rural World* relates an experiment in fertilizing strawberries:—"I procured a half-hogshead, filled it with rain water, and put into it one-quarter pound of ammonia, and one-quarter pound of common nitre. When the strawberry plants were blossoming out, I gave them a sprinkling of the solution at evening, twice a week, until the fruit was nearly full size. The result was double the amount of fruit on those where the liquid was applied to what was obtained on those vines right alongside of those where none of the liquid was applied." Is it not possible that in a dry season clear water would have produced nearly equal results? To have made the experiment conclusive, he should have treated a portion of the patch with water alone, a portion with the solution of ammonia and nitre, and left a portion without either, and noted results.—*Rural Home.*

Zinc Labels for Trees.—Take of verdigris and sal-ammoniac each two drams, of lamp-black one dram, water 4 ozs, to be well mixed in a mortar, adding the water gradually. Keep it in a glass-stoppered vial. Write on the zinc after shaking it well, with a quill pen; and after it is dry it may be exposed to the weather, or buried in the ground for years, and it will remain as legible as when first written.

Apiary Department.

A Few Facts About Bees.

Successful bee-management must of necessity be based on correct knowledge of the instincts and habits of bees. These have been thoroughly studied by naturalists, and are fully expounded in works on insect life, which are deeply interesting, apart from their bearing on bee-culture as an industrial and remunerative business. In fact, we know parties who keep a hive or two of bees, just because of the interest and pleasure they feel in observing their wonderful ways.

Without going into the minute details which a thorough naturalist would be curious to master, there are certain facts capable of being put into small compass, with which it is absolutely necessary every bee-keeper should be familiar. These we propose to state in this article.

Bees are of three kinds. Every complete hive or colony, contains one queen, a number of drones, (the fewer the better,) and a multitude of workers "the more the merrier." The queen is the only perfect female, and lays all the eggs from which the other bees are produced. These eggs are of two kinds,—the one hatches into drones, or male bees, while the other produces as a general rule, workers. These however, are simply undeveloped females, and every worker egg, is capable, under special treatment, of developing into a perfect female or queen. The special treatment consists in building what is called a queen cell, a roomy, pendent receptacle, somewhat resembling a pea-nut, housing the egg or young larva therein, and feeding it with a peculiar substance Known among bee-keepers as "royal jelly." This food has the effect of fully developing the young female, so that she comes upon the stage of life, fully qualified to increase and multiply. Instinct impels the bees to raise queens when the hive becomes very populous, and swarming time is at hand, also when from any cause, the colony is deprived of its queen. Only one queen is required or allowed in a hive at one and the same time, and when from any cause, there is more than one, the workers kill the superfluous queen, if she be a stranger and interloper, or the reigning queen will kill the young rival who may have been hatched in the hive. Some times a queen will wander into the wrong hive, at other times bad weather prevents swarming, though the preparations have been made for it, and in such cases, queen slaughter is very apt to take place, unless as often happens, the workers protect the young queen until circumstances are propitious for swarming.

Within from three to five days after being hatched out, the young queen issues from the hive on what is prettily called her "bridal tour,"—courtship, marriage, and impregnation being all accomplished on the wing, during a brief flight. Only for this purpose does the queen ever leave the hive, except when a swarm issues. One impregnation lasts for a life-time. Before it occurs, strange to say, the queen has the power of laying drone eggs, afterwards she is capable of laying both drone and worker eggs. It sometimes happens, that a queen fails to meet a drone at the proper period for fertilization. She then becomes a drone-layer, and with such a queen, a colony is irrevocably doomed to extinction. This and other facts in the natural history of the bee, show the utility of movable frame hives, which admit of examination, and enable the bee-keeper to remove a drone-laying queen, and give the wasting colony a fertile queen, or brood out of which to rear one. The queen-bee is endowed with wonderful prolificacy, and when honey-forage abounds, instinct prompts her to put forth all her energies in the direction of fecundity. It has never been ascertained what is the utmost egg-producing capacity of the queen, but she has been known to lay as many as two thousand eggs in a single day. Her prolificacy is regulated by the food supply, and hence it is the policy of all good bee-keepers to stimulate by feeding in early spring, in order that there may be a large force of workers ready to take the field when the time of honey harvest arrives. The average life-time of a queen is about three years, but it is considered wise policy not to let her live to old age, but to replace her in good season with a young and prolific successor. Worker bees are very short-lived, not averaging more than about three months in the busy season. Incessant labor seems, to wear them out very quickly, and their places are filled by the new generations that come crowding on to the stage of being. Drones are reared only in spring as the time approaches for swarming, and as the honey-harvest draws to a close, they disappear, usually as the result of a general massacre, on the part of the workers. In an apiary, even a small one, but few drones should be allowed to each hive. Here the movable frame hive again displays its utility, as the bee-keeper can, by its use, remove drone-comb, and substitute worker-comb for it. The queen lays drone or worker eggs, according to the size of the cells that are available for her to deposite her eggs in. Drone comb is easily distinguished from worker comb, as it is much larger. Drones gather no honey, they are consumers only, and of course are a tax and burden on the productive industry of a colony. Their only function is to fertilize young queens, and in view of the facts above stated, it will readily be seen, that very few of them in each hive will suffice to secure the end for which they exist.

The workers, as their name denotes, are the labourers, and perform a variety of tasks. They keep the hive clean, feed the young brood, cater to the queen, build cells, gather pollen, propolis and honey, defend their home from invaders, ventilate the hive in hot weather, and warm it in cold weather. Their operations are carried on with wondrous system, a sort of military order and discipline being maintained in the hive.

Pollen which is the farina of plants is collected as food for the young brood. Propolis is a resinous substance used in filling up cracks, and fastening combs or frames Honey is gathered, not made, by the bees, it being a natural secretion in most flowers. Beeswax is not gathered but manufactured by the bees, and the process may be watched in an observing hive when comb-building is going on The bees fill themselves with honey, hang in clusters or chains, and by some internal process, secrete the wax, which may be seen exuding from between the scales of their abdomen in the form of little white scales. These are taken up by fellow-workers, and formed into cells, which are built with true mathematical precision, and combine strength with the least expenditure of material, in a manner which has excited the wonder of philosophers, and formed a theme for poets in all ages. The manufacture of wax and the building of comb, occasion a large expenditure of honey, and hence it is good policy to preserve and utilize comb as much as possible. It lasts many years, if taken care of, and the extractor or melipult, is a most valuable invention, because it enables the bee-keeper to obtain honey without the destruction and loss of comb.

The eggs laid by a queen bee hatch in three days into small grubs or worms: These are fed and nursed until about the eighth day when they become nymphs, and are sealed up in their cells, whence they issue perfect bees, A queen matures in from ten to seventeen days from the laying of the egg; a worker in twenty-one days; a drone in twenty-four days.

The Italian Bee.

(Translated from the Bienenzeitung)

In unpropitious years one learns the worth and superiority of many of the productions of nature, which in good years are not so apparent, owing to the abundance of the yield. It is thus with the Italian bee. I admit that I did oppose the introduction of that bee. Yet the past year the worst we have had in thirty years, has altered my opinion. Now, from the fullest examination, I believe the Italian to be the race most suitable to Germany. Whether those Italians reared artificially by Herr Vogel, are equal to the native Italian, is yet in my mind, a matter of doubt. The appearance is there, but that does not make the Italian bee. In the spring of this year, I had sixteen stands alike as to numbers and quantity of food. Four of these were Italians, and the remaining twelve German bees. During the fine days of March, they all flew alike, and my hope was consequently much raised to obtain this year a large yield. Then came the bad days of April. Were there some few good hours during the day, they were invariably followed by cold winds or wet weather With the opening of April, my sixteen stocks, during propitious moments flew strong.

But what did I live to see? All the paths of the garden, and the ground around the hive, were covered with German bees, yet no Italians were to be found among them. I then watched the fly-holes Out of all the hives, many bees flew, the Italians however alone returning. It was a rarity, did the German bees return to the hive. The natural result was, that the German stocks were becoming weaker and weaker, while with the Italians, there was no diminution apparent. Further, by the end of April, the German bees had no brood, while the Italians were rich in brood. May was like April. My German stocks had become so weak, that except in the warm hours of the day, not a bee was to be seen. The Italians on the contrary increased in strength from day to day, and by the end of May began building comb. Long before this I began to feed the German bees, so as to keep them alive. On the tenth of June, the raspberries began to bloom. The weather became warmer. The Italians began with their whole strength to gather from the raspberries. The weak German stocks were able to gather little. On the twentieth of June, the Acacia began to bloom, but its blossoms were not as rich this year in honey, as they had been in former years, the frost having destroyed fully one-half of the blossoms. The Italians now developed daily a stronger flight, as the young bees made their appearance. After eight days, they ascended to the surplus honey rooms and built them half full of comb. The German bees now only began to have large supplies of brood. When on the eighth of July, the Linden began to blossom, and the Italians were so strong, that I began to expect them to swarm. The German bees had also become stronger, and were laboring rather industriously on the Linden, yet the most of the honey brought into the hive was used for feeding the young brood; there was none stored of any account. With the end of the Linden blossoms the harvest was practically over; still the German stocks continued to increase in numbers so that by the end of August, they were over populous. The Italians had at that time filled all the honey room with honey, about thirty pounds, and in the brood chambers there was a superabundance for winter use. When at the end of August I inspected also the German stands I was astonished. All the stocks were in arrears, so that in order to winter them I had to feed them strongly. Had I only Italians, the year 1871 would have been for me a good ordinary one, as four stocks of this species would have given me a yield of one hundred and twelve pounds of honey.

Feeding Bees.

D. L. Adair, the well-known bee-keeper of Kentucky, says—

"Five pounds sugar fed to a colony of bees in March and April will secure the return of fifty pounds of honey in June. There are more bees lost by starvation in early spring than from all other causes during the winter. As soon as the first food is carried into the hive in spring, the queen commences to lay her eggs; an unfavorable change in the weather, cutting off the supply of food, endangers the life of the whole colony. They should be fed to prevent this, and also to stimulate the queen as much as possible, so that they may be strong when honey becomes plentiful enough to gather a surplus.

"The ovaries of the queen bee contain the germs of about half a million of eggs, and when they are exhausted the queen dies. A prolific queen will lay them all in two years, while others take five or six years to accomplish it. The latter are unprofitable and should be destroyed. A queen that is stimulated to lay to her utmost capacity during the first month of her laying will be prolific all her life; while one that is so situated or treated that she lays little or none during that time will likely be unprolific as long as she lives and will live a long time."—*Farmers' Union.*

Correspondence.

Beet Root Sugar.

In answer to our York correspondent "a Constant Reader," the best work ever yet published in English on this subject, is "Crookes' Manufacture of Beet root Sugar." It, and the July and August numbers of the *American Chemist*, can be obtained from any Toronto bookseller.

With regard to the price which a sugar refiner can afford to pay for concreted Beet juice, that entirely depends on the care with which that substance is prepared, and it therefore would be dangerous to hazard an opinion. Sugar refiners do business on such an enormous scale, that they are satisfied with a very small profit *per pound*, the price to be obtained entirely depends upon the quality The only sugar refiners in Canada, at present, are in Montreal—Redpath & Co., and Molson & Co.,

By the last mail we received a letter on this subject, from one of the largest sugar refiners in England His advice is, that we in Canada should establish small joint stock factories fitted with simple and good machinery; that the farmers should send in their roots to these factories, where they can be pulped at the least possible cost, and as rapidly as possible. In these factories the juice would be reduced to concrete, and afterwards refined into sugar fit for use. The refiner in question worked 7,800 tons of Beet root during the last season.

To do a profitable business in Beet sugar, the manufacture of the juice into concrete, or syrup, and the reduction of that substance into refined sugar, must always be conducted in two separate departments. The preparation of the roots will only occupy from four to five months of the year, while the refining must be continuous.

The concrete, or syrup, from Beet root is now a regularly received article in the Scotch and English refineries, it has a certain value, which is always fixed according to the quantity of sugar contained in it, and the absence of deleterious ingredients, salts, &c., for the ascertaining of which refiners have proper instruments. The syrup is prepared both in the old method of evaporating in open pans; and also by the use of "Fryers Concretor," this latter is by far the best system, as it reduces the juice, in the course of once passing through the machine, from the thin clear defecated syrup (which is liable to rapid deterioration and destruction by fermentation,&c., into a thick consolidated syrup, which for all useful purposes is indestructible.

The question of freeing the manufacture of Beet sugar from duty for a certain number of years after its establishment in Canada is now before the House of Commons.

Hair as Manure.

R. B., St. John, Newfoundland, writes to know how hair can best be prepared for manure:—*Answer.*—We know of no better plan to prepare hair for manure, than to decompose it by the use of wood ashes and lime. This mixture will form caustic potash, and will at once attack the hair and destroy it. Lime alone will do little towards decomposing hair, and carbonate of potash, will be slow in its action. But caustic potash made with fresh ashes and lime fresh from the kiln, slaked with water sufficiently to fall into powder, and at once without delay mixed with the ashes and then thoroughly incorporated with the hair, will produce the desired effect. The lime, ashes, and hair, mixed much better dry than wet, and after mixing, water must be used sufficient to release the caustic potash from the ashes. After decomposition the mass must be exposed to the air, and turned frequently to absorb carbonic acid, otherwise it will prove destructive to plants; and very difficult to handle, the alkali will of course make the hands very sore, unless thoroughly carbonated by exposure. Hair alone, and undecomposed, is most extensively used in Britain, to manure hop fields. Vast quantities of woollen rags, and hair, are used in the countries adjoining the Mediterranean, for manuring the olive plantations. It is applied without preparation, round the roots of the trees, and is said to double the crop. No manure (except horn shavings) equals hair for vines, and it is usually applied also (as with olive trees) without preparation. Hair can readily be dissolved by sulphuric acid, but of course this mode costs more than if wood ashes and lime, are used. Moist earth also greatly assists decomposition of hair, and it is probable, where freight is of no consequence, the addition of moistened clay would prove very beneficial in the preparation of manure. There is no doubt that moistened earth alone, would entirely decompose hair, without any other agent to assist, but the process would be slow.

Food for Mares.

"A Subscriber" writes us from Fitzroy to know whether a mixture of one-half peas and one-quarter each of barley and oats would be detrimental to a mare previous to or after foaling. He also asks what is the best food for increasing the milk of a mare in the above position. *Answer.*—Provender containing such a large proportion of peas is a very nourishing diet, but is of a too stimulating character to be fed largely to a mare immediately previous to or soon after foaling. As to the second point, two-parts of oats and one of barley boiled together and mixed with a little bran and linseed, forms a nutritious and safe diet for a mare whilst suckling her foal, and as a matter of course, a moderate quantity of good hay must be allowed. The best kind of food, however, is good pasture, supplemented daily with five or six quarts of oats.

Stable Floors.

J. T., wishes to know what preparation clay requires to render it an efficient substitute for boards in a stable floor. *Answer.*—The attempts have often been made, to use tenacious clay for stable floors, sometimes mixed with gravel, and rammed down with a paviors rammer, until hard as a brick. But directly any liquid manure is deposited on it, the clay becomes softened and breaks up. A mixture of water-lime gravel and coarse sand, forms a good concrete floor, which may answer for cows and calves, but certainly not for horse stables. The corks of the horses' shoes. would disintegrate any concrete or earthen floor. Cobble-stones firmly put in, on a thoroughly drained gravel bottom, seem the only substitutes for wooden floors in Canadian stables.

Fine Cattle.—Mr. James Auld of Eramosa, Co. of Wellington, has recently sold six head of very fine steers, rising three years old, to Messrs. Satchell Brothers, Ottawa, the heaviest weighing 1820lbs.; the gross weight of the six being 9410lbs., and the price six dollars per 100lbs., live weight. Messrs. Satchell are purveyors to His Excellency the Governor-General, and being an enterprizing firm, lose no opportunity of securing first class cattle at high prices.

Swindlers.—The latest dodge is as follows.—The *pretended* agent of some publishing house presents himself with a large bundle of "five dollar" (but in reality only two and a half cent) chromos, and a sample copy of some trashy sensational newspaper or periodical. The subscription price is "only two dollars a year," and a chromo is magnanimously "thrown in." The picture delights the children, the money is thoughtlessly paid over, and that is the *last ever heard* of either agent or periodical. We are informed that this little game has been played pretty extensively of late, and we caution our readers to be on the alert.

THE CANADA FARMER

IS PUBLISHED

ON THE 15th AND 30th OF EACH MONTH,

AT

One Dollar-and Fifty Cents Per Annum,

FREE OF POSTAGE.

It is sent to Great Britain and Ireland by mail, for six shillings sterling, *per annum.*

No subscription received for a less term than one year, commencing from the month of January.

The Canada Farmer is stereotyped, so that copies of back numbers can always be had.

A limited number of advertisements are inserted at twenty cents per line for each insertion. There are twelve lines in one inch of space. Advertisements under ten lines are charged as ten line advertisements.

All letters and money orders are addressed to

THE GLOBE PRINTING CO.,

Toronto.

☞ Agents wanted in every town and village in the Dominion to canvass for subscribers. Liberal commission allowed. Send for circular stating terms.

The Canada Farmer.

TORONTO, CANADA, MAY 15, 1873.

Ontario Agricultural College and Model Farm.

We heartily rejoice that the proposal to establish an Agricultural College for the Province of Ontario at Mimico, has been finally abandoned. Had it been gone on with, public patience would have been exhausted and an enormous sum expended, before any practical results could possibly have been obtained.

The precise locality to be selected as the site of the institution seemed to us a very unimportant matter. Of vastly greater moment is it that the land should be of good quality and capable of raising with good tillage, first-rate crops. And even of greater importance is it that the institution should be commenced on a sound, practical system, and have at its head a man thoroughly up to the day in the science and practice of agriculture, of large experience, of considerable force of character, of kindly manners, and with enthusiasm enough in his own composition to infuse warmth and vigor into those around him. We hear that the Government intend advertising for a competent Chief Superintendent—and we earnestly hope that the best man available will be appointed without regard to other considerations than thorough efficiency for the post.

We do not understand that any system for the conduct of the institution has yet been definitely settled. We venture to express the hope that when a system is adopted, the idea of including a scholastic and literary curriculum for the young men within the Institution, will be entirely dismissed from it—and that the main object kept in view will be to give useful instruction in the science and practice of agriculture to as large a number of our young men as possible, and send them back to their homes as soon as possible with hearty love for the profession of farming; and sound, practical, common sense plans for prosecuting it with vigor. We have already in full and successful operation common schools, grammar schools, and colleges, amply sufficient to supply literary education for all our youth, whatever calling they may select, and we should deeply regret if our young farmers were to be seduced from attending our great national institutions, and subjected to the dis-

advantage of an isolated education. Agriculture is pre-eminently the occupation of the Canadian people. Our whole prosperity and advancement depends upon its skilful prosecution, for all other avocations rest upon its success. We have splendid farms, frugal, industrious and intelligent farmers, and excellent farm-stock of all kinds—but what is yet wanted is a thorough knowledge spread all over the country, how best to use in the most effectual and profitable manner, the great advantages for good farming we so abundantly possess. If the Guelph Model Farm shall contribute efficiently towards this end, it will amply repay all the money expended upon it—were it vastly greater than it possibly can be.

The second leading end to be kept in mind in the management of the institution, will we trust be to make accurate experiments on practical points directly affecting the daily practice of the Canadian farmer, and publish them to the world.

Book Farming.

Nothing more irrational can be imagined than the prejudice, which so largely prevails among farmers, against what is styled "Book farming" Without the aid of agricultural publications, would not the practical experience of practical agriculturists be entirely lost, except in their own immediate neighborhoods? Without the aid of scientific research, would not a thousand questions of the highest practical importance to the farmer have been left unsettled? Without books and papers, what should we know of crops and herds and tillage in other countries? Why is it that in every other occupation, except farming, every new light, every suggestion for its advancement, is hailed by those engaged in it with interest and cordiality? No man of sense would dream of a farmer adopting every new plan, however good, commended by an agricultural journal. On the contrary the circumstances under which farmers carry on their operations are so diversified by a thousand causes, that no absolute rule, on almost *any* point, can be made of universal application. All that any sensible man can hope for is that agriculturists shall read carefully and earnestly, ponder well all apparently good suggestions, and adopt such of them as, from their own several points of view, commend themselves to their approbation as practically advantageous. Although very much that a farmer reads may not, from peculiar circumstances, fit his particular case, or be expedient to adopt with a limited capital—still there is much in every agricultural paper that issues from the press, which the most experienced agriculturist may read with profit, either by the suggestion of new ideas, the modification of old ones, or the revival of forgotten ones. Agricultural articles are necessarily on all sorts of subjects, and in a new country like Canada, the raw beginner has to be written for as well as the accomplished farmer; and thus articles that prove of great value to some, seem quite impracticable to others. "Book-farming" by no means undervalues the practical knowledge of practical workers; on the contrary its main mission is to gather the practical lessons which practical men have learned, and publish them far and wide for the advantage of the world. Nor should any farmer start off in disgust because a thing is recommended which to him seems unremunerative, or (if remunerative) beyond the means of ordinary farmers to accomplish. The thing may be *right* and profitable in itself, notwithstanding, and though beyond the means or the courage of very many farmers, it may be highly desirable and advantageous to have it tried fully and fairly

EGGS FOR HATCHING.—A correspondent wishes to know where he can purchase pure dark Brahma and Aylesbury duck eggs. Some of our friends having these for sale, might do well to let it be known through the advertising colums of THE CANADA FARMER.

The Downing Gooseberry.

In the last number of the "FARMER" we gave our readers a very good representation of this variety of the gooseberry, and laid before them what Mr Hooker had to say concerning it and other American gooseberries, great difficulty has been experienced by those who have endeavored to raise gooseberries, by reason of the mildew that attacks both the fruit and foliage of all the English varieties. There are a few favored localities where the mildew is not troublesome, but on the whole there has been very little success in the cultivation of this fruit. We have grown the Downing Gooseberry for some fifteen years, and with very satisfactory results, while in the same grounds the English varieties mildew so badly that they are in fact worthless.

The berries of the Downing are not as large as those of the English kinds, though they are much larger and much finer in appearance than the Houghton. The color when ripe is a very pale green, and the flavor is much like that of the Houghton. But the chief value of this variety is the basis which it furnishes for our experimenters and hybridists, from which to raise some larger fruited berry, which shall be as free from mildew as this. In the hope that some may be stimulated to further experiment, and to make our people acquainted with the best variety of American Gooseberry in cultivation, the Directors of the Fruit Growers' Association of Ontario have decided to send out to its members a plant of this variety next year. By this means it will have a very wide dissemination, as the society has now a very large membership scattered through all parts of the Province, and in a few years we will have ascertained whether this variety proves to be generally as valuable as a substitute for the larger English sorts as it now promises.

It is to be hoped also that attention will be turned to the production of new varieties from this and other American sorts, and that we shall give up the hopeless task of trying to grow the English Gooseberries when it is so evident that they can not be grown.

American Short-horn Record.

The American Short-horn Record, published by Mr. A. J. Alexander, of Woodburn, Kentucky, is conducted on very conservative principles. It gives in its pages all the ancestors, to the remotest generation of every animal entered in the *Record*. No female is allowed to be entered until she has proved herself a breeder, by producing a calf. There are also other improvements, which will prevent the work from ever becoming cumbersome, costly or unwieldy. Two volumes have already appeared and a third is to be issued very soon. Canadian Short-horn breeders would do well to make a note of this. The price of the *Record* per volume is about that of the *Canada Herd-book*.

Amorphallus Rivieri.

In the first number of the CANADA FARMER will be found the opinion of a correspondent of the *Rural New Yorker* concerning this new plant. For the information of our readers we may state that it can be planted out of doors in June as we now plant the Dahlia, and taken up as soon as the frost cuts the foliage or the stem dies down. It is a singular aroid, which throws up a thick white spotted stem, crowned by a large palmate leaf from two to three feet in diameter.

The Royal Dublin Spring Cattle Show.

The forty-third annual stock exhibition, held in April, was considered the best that has yet been seen. The show of Short-horns, particularly in the younger sections, was excellent. No doubt, out of 148 yearling bulls there were some, but not many, that would have been better left at home.

The exhibition of implements and machinery was the best and largest ever known here; but this was so closely packed as to render it difficult, if not impossible, to examine and contrast the merits of no less than 101 stands. The English exhibitors were the most numerous.

The Herefords, as for some years, put in but a short appearance. Of polled Angus cattle, there were four bulls and four females. In the Devon sections, there were but one yearling and two aged bulls, two heifers, and one cow; John Peake, Mullaghmore, taking all the prizes. Of Alderneys there were nine bulls, three heifers giving milk and four cows.

Of fat cattle there were about fifty-five.

The show of black and white pigs was as good as could be desired, they were not numerous in their several sections, but they occupied about 40 pens, and though good and well bred, there was nothing amongst them to call for any particular notice.

The show of poultry was the best we yet have had: it embraced every new, good, useful, and ornamental variety, and all in the best plumage and condition. The entries occupied 247 pens, taking up the entire gallery round the Central Hall The pigeon show was an interesting sight to the lovers of that class of birds. The several distinct varieties were divided into about 20 sections, occupying 158 cages.

The weather was beautifully fine, and, on the whole, The Royal Dublin Society's spring meeting for this year has been a success. The Lord Lieutenant, Lady Spencer and suite visited the show on Wednesday, and remained some hours examining all the details.—*Mark Lane Express.*

Agricultural Depression in Britain

We regret to learn from a speech recently delivered by Mr. McCombie, M.P. for West Aberdeenshire, when accompanying a deputation of Scottish members to induce the Chancellor of the Exchequer to remove the gun tax, and the tax on shepherds' dogs which are felt to be grievances by Scottish agriculturists, that the farming interest in Scotland is in a very depressed condition indeed. Mr. McCombie, whose acquaintance with tenant farmers throughout Scotland is both extensive and intimate, asserts that the year 1872 has been the most disastrous year in the century to the tenant farmers of Scotland. The average price of wheat in the Scottish market has ranged from 90 cts. to $1.10 per bushel, with a diminished *quantity*—less than half—to dispose of, and with a deteriorated *quality* from sprout in consequence of the very wet harvest. The potato crop was completely destroyed, and the turnip crop, on which the farmer depends so largely for his profits, were scarcely half a crop. The consequence is that farmers are giving up their farms in all directions, and where, a few years ago, there used to be ten applicants for every farm to be let, now there are ten farms for every applicant. Mr. McCombie mentioned the case of a farm in his own native parish that was advertised to rent, and on the day fixed for letting it, there was not a single offer for it.

The Labor Question in England.

We are very sorry to see that the relationships between farmers and laborers are—thanks to the chief agitators, whom Sir M Hicks-Beach has described as "Communists in politics, and infidels in religion"—week by week becoming further and further estranged. If they had been left to themselves—if the foreign element we deprecated had not been introduced, masters and men might have arranged their differences easily. The result now is that a war of classes has commenced. The masters have formed a counter combination against the men—the strikes are to be followed by a lock-out. Not content with retarding the progress of cultivation as much as they could, the National Agricultural Unionists have resolved, if possible, to prevent the harvesting of the hay and corn crops when the time comes for their cutting and their in-gathering. With this view they have sent paid agents out to stump Ireland—to warn Hibernia's sons from coming over to England. The matter is now assuming a very grave form to the community generally, and if the bitterness of strife continue—if the corn be allowed to lie waste upon the ground—in spite of free trade, the industrious classes may expect to have to pay double the price for their loaf, and meat will rise altogether beyond their means. We think it is time that some notice of this important question should be taken by the legislature.—*The (London) Farmer, 28th April 1873.*

Since our last issue we have received several letters of enquiry as to the prices, &c., of bone crushers. *Will* some of our manufacturers take the hint.

Wind-Mills.—Can any of our friends inform C. I where and at about what price he can purchase a serviceable wind-mill for farm use.

It will be well for those who are trying to raise fast horses to remember that the records of English turf history show that out of thirty colts, from thoroughbred stock on both sides, but one proves extra fast.

Speak to your neighbor who is not taking an agricultural paper, and tell him what you think of The Canada Farmer. We do not ask you to flatter it, but if it pleases you, you will assist us by communicating it to your neighbors.

Mr. Lochlan Kennedy, of Manitoba, has left with us a very beautiful sample of spring wheat, grown in the neighborhood of Fort Garry, and which took the prize at the show held there last year. The sample is plump and well colored and speaks volumes for the fertility of that section of the country, in which it was produced.

The death is announced, in his 79th year, of Sir John Sinclair, Bart., of Dunheath, which took place at Edinburgh. Sir John has long been a leading proprietor and spirited improver of stock in Caithness. He was for years Convener of the County, and took an active part in public affairs till recently, when advanced years and severe family bereavements induced him to retire.

Euphrasia Farmers' Club.—We notice in a late issue of the *Meaford Expositor* the report of a meeting held by a number of our friends in Euphrasia for the purpose of establishing a Farmers' Club. At the preliminary meeting *twelve* names were enrolled; but we have since learned that the list has been largely augmented, and that the society is fully organized and in capital working trim. Success to them.

North Dumfries Farmers' Club. – We are happy to learn from an old friend in North Dumfries that the Farmers' Club established in that township some time ago, has been highly successful. The meetings have been well attended, and a number of interesting agricultural topics discussed in a manner that promises well for the future usefulness and prosperity of the club We shall watch the proceedings of this and all kindred societies with much interest, and be most happy to receive condensed reports of their doings, for insertion in The Canada Farmer.

April in England.

If the weather had been made for the purpose of allowing farmers to overtake their extensive arrears of work, it could hardly have been more favourable than it has been during the greater part of the month. It would have required no very great stretch of the imaginative faculties, indeed, to conclude from the brilliancy of the sunshine, and the general balminess of the atmosphere, that we were enjoying June instead of April weather. During the past week however, there has been a decided and detrimental change in the weather; the thermometer has fallen considerably, and young blades and blossoms will suffer from the frosty temperature, and the chilling blasts of wind accompanied by snow, and hail, and sleet. The inactivity which has continued for the most part since, and even preceding the opening of the year, in the corn trade, has not been relaxed during April. Importations have been liberal throughout the month, and that fact, coupled with the influence of the warm weather, has caused a depressed and slow trade at prices exhibiting generally a decline upon the quotations of March. In the second week, when much cooler and more seasonable weather prevailed, rates in some few districts recovered the 1s. per qr. decline of the opening week, but this recovery was by no means general, on account of the restrictive tone of trade. For the most part, therefore, the business of the month in the corn markets has been slow, corn being 1s. per qr. cheaper than was the case in the preceding month. Up to last week, when a sudden dullness overtook the trade, business in the cattle markets has been steady, at times approaching briskness, as has been the case in London up to Monday last. The extremely high prices demanded, however, has its inevitable effect of limiting consumption for both beef and mutton, and there is seldom seen that genuine activity which urgent requirements must, under more favourable circumstances as to prices, have occasioned.—*The (London) Farmer, 29th April.*

Number of Shingles in a Roof.

J. D. Tate gives to the New York *Farmers' Club* a rule for estimating the number of shingles required for a roof of any size, one which he thinks every mechanic and farmer should remember First, find the number of square inches in one side of the roof; cut off the right hand or unit figure, and the result will be the number of shingles required to cover both sides of the roof, laying five inches to the weather The ridge board provides for the double courses at the bottom. Illustration: Length of roof, 100 feet, width of one side, 30 feet; 100x30x144 equals 432,000. Cutting off the right hand figure we have 43,200 as the number of shingles required

Railroad Ties.

A recent lumberman's circular estimates the number of railroad ties in present use in the United States at 150,000,000. A cut of 200 ties to the acre is above rather than under the average, and it therefore required the product of 750,000 acres of well-timbered land to furnish the supply. Railroad ties last about five years; consequently 30,000 ties are used annually for repairs, taking the timber from 150,000 acres. The manufacture of rolling stock disposes of the entire yield of 350,000 acres, and the full supply of nearly 500,000 acres more every year. It appears that our railroads are stripping the country at the rate of 1,000,000 acres per annum, and their demands are rapidly increasing.

Preserving Shingles.

There is a good deal better way of doing this than to paint them We have seen shingle roofs kept till fifty years old, only by the application of lime Here is a very effective receipt for preserving shingles · Take a potash kettle or large tub, and put into it one barrel of wood ashes lye, five pounds of white vitriol, five pounds of alum, and as much salt as will dissolve in the mixture Make the liquor quite warm, and put as many shingles in it as can be conveniently wetted at once. Stir them up with a fork, and when well soaked, take them out and put in more, renewing the liquor as necessary. Then lay the shingles in the usual manner After they are laid, take the liquor that is left, put lime enough to make it into whitewash, and apply to the roof with a brush or an old broom This wash may be renewed from time to time Salt and lye are excellent preservatives of wood.—*Ohio Farmer*

A Seductive Rat Trap.

A man in Pennsylvania has invented a rat trap that is made to operate upon the selfish passion of the poor rat and lead him into trouble. The *Mechanic and Farmer*, in a description of the trap, says that a mirror is set in the back of the device beyond the bait, and as his ratship is out on a foraging expedition, he espies the bait, and at the same time believes his own image in the mirror to be another rat making for it on the opposite side. This is too much for rat nature to stand and be cool over, so he rushes for the bait. But alas! The noble rat has fallen; for a sharp, two-tined steel fork has come down upon his luckless head and has penetrated through skin and skull, and in the brain where one short moment before rankled avarice, now rankles two of death's arrows. But this is not all. The gullet, down which was expected a sweet morsel to pass, is now pierced and bleeding, for another spear has entered it from below.—*Farmers' Union.*

Hog Trade of the West.

The whole number of Hogs packed in the West, for the winter seasons of 1849-50 to 1871-72 inclusive, as compiled by the Cincinnati Price Current, is shown by the following table:

Years.	No. of Hogs.
1849-50	[illegible]
1850-51	[illegible]
1851-52	1,182,846
1852-53	2,201,110
1853-54	2,351,770
1854-55	2,124,404
1855-56	2,480,702
1856-57	1,818,468
1857-58	2,210,778
1858-59	[illegible]
1859-60	2,350,822
1860-61	2,155,702
1861-62	2,886,666
1862-63	4,069,625
1863-64	3,261,196
1864-65	2,521,770
1865-66	1,785,955
1866-67	2,490,791
1867-68	2,781,084
1868-69	2,499,873
1869-70	2,635,312
1870-71	3,695,251
1871-72	4,860,449

The Art of good Farming.

Most farmers will admit that there are crops to be harvested at such a stage of their existence as to take but little from the soil. Grain if cut in the milk is excellent for feeding while green, especially to milch cows, and exhausts the soil but little. Grain when cut in blossom and cured well, makes hay of the first quality and is, we believe, less exhaustive to the soil than when allowed to come to maturity. The art of good farming lies, first, in growing as much unexhaustive produce as possible, and second, in converting such product into manure for the increasing of the fertility of the soil, and this conversion must be in a manner that shall bring the most profit; this can be done only in feeding live stock. By following this system faithfully the farmer, his farm, and his stock, all thrive together, rendering him a three-fold profit. We believe that any good grass farm, the soil of which has not been robbed of its fertility, if the grass be cut while in blossom, and the aftergrowth never disturbed, but allowed to rot, will continue to grow larger crops of grass so long as the above practice is continued. We would never in practice allow a hoof upon our meadows, believing it in the highest degree injurious to succeeding crops.—*Vermont Farmer.*

Chalk for Fuel.

Among the later theories for economising in fuel without sacrifice of comfort is the substitution of chalk for coal. Not wholly, however, but for the greater part. A gentleman who has made a thorough test of the matter declares himself satisfied beyond doubt of the superiority in heat-giving properties of chalk over coal. The idea is an old one, but we have never heard of any practical attempt being made to turn it to account before. With those who have ever noticed the great specific heat of chalk or the large amount of carbonic acid contained in it, and the convertibility of that acid into carbonic oxide by means of heat; or with those who have merely noticed either the vast amount of heat which, generated by a comparatively small amount of fuel, is radiated from a limekiln; or again, the effect in smelting ore of a few hundred pounds weight of limestone or chalk, it has long been a matter of strong persuasion that the time must come when chalk, and perhaps limestone, shall be made subservient to the increase of heat and the diminution in the consumption of coal. Our late fire presented hundreds of instances of the intensity of the heat of limestone, and the length of time it was retained even by small fragments. With regard to the experiments referred to, it is asserted that by using chalk and coal in about equal proportions, the chalk being placed at the back of the grate and the coal in front, a saving of at least 75 per cent. was effected in cost, with a more intense heat and cheerful blaze than would have been obtainable from coal alone.—*Boston (U.S.) Globe.*

Lincoln Great Horse Fair.

This great Lincolnshire horse fair was recently held in the town of Lincoln. There was, as usual, a large attendance. The supply of horses was numerically below the average, but the show produced a superior collection of horses. There was a lively demand for every class of useful animals, and a large number of horses were sold by private sale and public auction. Horses, young and of good promise, suitable to breaking to private carriage purposes, 65gs. to 85gs., and ditto of good fashion, and seasoned down to harness, 100gs. and upwards; and well-matched pairs of young carriage horses, greys, bays, or chestnuts, realized from 240gs. to 300gs.; horses suitable for omnibus, vans, machine work, &c, were in active request at from 40gs. to 60gs.; and cart horses, of high class, suitable for London brewers and merchants, 45gs. to 65gs.; riding horses, of good stamp, 50gs. to 70gs.; and ditto of grand action, for park riding, &c. 110gs. to 150gs.; aged hunters 60gs. to 80gs., and ditto of good pedigree and reputation in the hunting-field, 150gs. to 250gs.; and young Irish horses, of good blood 75gs. to 130gs.; saddle cobs of handsome contour, and up to heavy weight, 45gs. to 70gs.; cover hacks of good breed, and galloways, 40gs. to 50gs.; harness cobs 30gs. to 40gs., and good roadsters and trotters, of known celebrity, 35gs. to 90gs.; and aged horses 25gs. to 30gs.; horses adapted for the artillery and military purposes were in active competition, and realized high prices; and for some days prior to the fair "commissioners" were travelling this county, and buying up horses on the road *en route* to this fair. London horse dealers were large buyers, and many strings of horses were purchased for foreign exportation. During the fair Messrs Tattersall sold the stud of horses, the property of the late Mr. Welfitt.

Veterinary Department.

DISEASES OF THE HORSE'S FOOT.

Pricking in Shoeing.

This injury is of frequent occurrence, sometimes the result of carelessness, although it is an accident which may occur with the most careful of shoers. In some cases the nail may not actually penetrate the sensitive parts, but it is in such close proximity that when the horse is used, it presses upon the quick, immediately setting up irritation, and if the exciting cause is not speedily removed, the suffering is very great.

Symptoms.—Soon after being shod the animal is noticed to be lame, which gradually increases, the foot is hot, by removing the shoe, and tapping the foot with a hammer, or with the aid of the pincers, the seat of the injury can at once be detected. If suppuration has taken place, it will be necessary to use the drawing-knife freely, and allow the matter to escape; then poultice the foot, and treat generally as recommended for puncture.

Canker.

This is a disease of the foot of an inveterate character, and consists in a fungus growth extending over the whole or part of the sole and frog The causes of this troublesome complaint are injuries, or neglected or improperly treated cases of thrush; or it may supervene upon a virulent attack of grease. The primary exciting cause may be due to the injurious effects of the wet and filth in which some horses have to stand.

Symptoms.—The foot is unnaturally hot and tender, and the frog is very soft and spongy, giving off a copious secretion of offensive matter. The sole soon becomes diseased, followed by a separation of the horny and sensitive sole. The fungus continues to grow quickly, and is very vascular, bleeding freely if an incision is made into its substance.

The treatment of canker generally proves very tedious, and in commencing, it is necessary to remove carefully all detached horn, and afterwards use astringents and caustics freely. In all severe and obstinate cases the most potent remedy is nitric acid, which must be carefully applied over the fungus, and then cover with a pledget of tar and tow, firmly kept in its place by pressure of some kind.

It is necessary to exercise great patience and perseverance in treating this disease, and it is found beneficial in many cases to occasionally change the dressing, using sulphate of copper, chloride of antimony, or nitrate of silver. In all severe cases the fungus grows with astonishing rapidity.

Canker will in some instances prove incurable, and when the more internal structures, as the bones and ligaments are implicated in disease, the most humane recourse is to destroy the animal.

Sand Crack, or Quarter Crack

Sand crack is a fissure extending through the wall in a parallel direction to its fibres, and has been so named, sand-crack, from its being so often met with in hot sandy countries; the extreme heat and dryness rendering the feet brittle and predisposed to crack. Sand-crack occurs oftener to the fore than to the hind feet, and is usually situated towards the inside heel, and is commonly called Quarter-crack; but the crack may appear in the fore part of the wall producing great irritation and suffering.

Thin and brittle feet are predisposed to this disease; but hard work and dry weather are great excitants, and it also proceeds from the effects of external injuries as treads or bruises, and a very common predisposing cause is allowing horses to stand for days in the stable, without giving regular exercise, the hoof becomes brittle, and easily broken down.

Sand-crack often appears very suddenly; the horse is observed to go slightly lame, and a close examination will reveal a small crack, just between the hair and the hoof from which blood oozes. If the animal is kept at work, the crack soon extends, and the divided edges rub against each other, creating irritation of the sensitive parts, causing inflammation which often terminates in the suppurative process, producing very great pain and lameness.

The treatment of Sand-crack is necessarily tedious, as the divided edges do not reunite, but the growth must proceed from above. In many instances, however, the disease may be successfully treated, and the patient kept at moderate work. If the irritation is severe, as in cases where suppuration has occurred, the horse must have rest, and the edges of the crack thinned carefully, and the foot afterwards poulticed until all pain and tenderness is removed; and to prevent the divided edges irritating the sensitive parts, the hoof may be bound tightly with a small cord or strap, or a clasp applied, and it is generally advisable to use the firing-iron lightly both at the upper and lower extremity of the crack. The growth of horn is greatly stimulated and assisted by the application of a blister and in the most of cases very great benefit is derived from the use of a properly fitting bar-shoe, giving frog pressure, and taking the weight off the weakened quarter. It takes several months before a crack completely grows out.

Treads and Overreaches.

Caulks, &c., are common injuries to the foot, especially during the winter, when horses are shod with high and sharp heels. Very often these injuries seem of a trivial character, but if neglected the consequences are often serious. In the treatment of such cases, the parts should be thoroughly and carefully cleansed with tepid water, and if any hair is forced into the wound it must be removed with the forceps. The shoe should be removed, and a pledget of tow saturated with tincture of benzine or carbolic lotion applied to the wound. When suppuration occurs, which may be easily known by the increased pain and lameness, it will then be necessary to use the the knife freely, and cut through the wall at the under part of the wound to allow the pus to escape, after which immerse the foot in warm water for half an hour, and afterwards apply a small poultice to the wound. If the pain is very severe, it may be advisable to use an anodyne lotion, and when proud flesh springs up, astringents and mild caustics must be applied. Irritant dressings and caustics, however, should not be applied in the early stage, as very great harm is sometimes done by the incantious use of these severe dressings in the treatment of Treads.

Tumours on the Face of Cattle.

We have lately been consulted about a disease in well bred cattle, which appears as a tumour upon the face, and is of a malignant character. The disease in question has been termed *Osteo sarcoma spena ventosa*, and *fibro plastic* degeneration of bone, and is by no means uncommon amongst the cattle of Britain and on the continent of Europe. The parts principally affected are the upper and lower jaw, and it first appears as a small circumscribed swelling, which gradually extends and involves the bones, producing a large bony tumour, which is divided into several cavities containing acrid matter, the bones in the face, in some instances, becoming carious, and even the teeth are affected. In some cases it is a considerable time before the animal appears to experience any great inconvenience from the tumour, and will remain in good condition. When, however, a discharge of matter takes place, there is gradual loss of condition.

As to the causes of this complaint, it is generally supposed to result from some intrinsic influence, rather than direct injury to the part, and possibly, in some cases, it is the result of too close in breeding, whilst in others it is due to a scrofulous diathesis, and therefore we have no hesitation in stating that it is somewhat unsafe to breed from animals affected with this disease; and without the animal affected is an extremely valuable one, we would recommend it to be fed for the fat market.

In certain cases, mercurial applications may retard the growth of the tumour for some time, and relief may occasionally be given by removing the growth with the knife, but the success of either method of treatment, will altogether depend upon the extent and intensity of the disease.

Accumulation in Horses' Stomachs.

Mr. J. Begg, manager of the Springbank Chemical Works, writes to the Glasgow *Herald* to say that the following materials were found in the stomach and intestines of a horse, the carcass of which was sent to the works. Broken nails, 629; nails 1½ to 2 inches long, 30; ditto, 1 to 1¼ 144; spring nails, 1 inch, 131; ¾ inch tacks, 158; [screw nails, (6) whole and 3 broken,) 9; rivets, 2; broken gas burner, 1; shoe tachets, 15, broken pieces of metal, 129; nail heads, sorts, 102, small washers, 5, buttons, (4 whole and 4 broken,) 8, pieces of lead, zinc and round shot, 75, small pieces of wire, 121; pins, 33, ditto broken, 4 needle, 1; ditto broken, 20; small broken pieces of wire riddles, 889; glove catch, 1; boot eyelets, 7; hook-and-eye, 1, small wire staple, 1; small brass ring, 1; odd bits of metal, 8;—in all, 2,525 articles, weighing 3lb. 2½oz; and of gravel and sand, 6lbs. 13oz.

Mud Fever.

During the past two or three weeks a great many horses have been attacked with a disease of the skin of the legs, belly, &c., the hair falling off in patches.

It is an acute form of *erythema*, consisting in inflammation of the outer layer of the true skin, and has been brought about by the cold wet weather we have lately experienced. In some parts of Britain, this disease is known as mud fever, and we think the same name would be very applicable in the present case, as the streets of this city have had a very severe attack of the fever for sometime past.

Erythema proceeds from various causes, but in the present case the great exciting cause has been the irritating effects of wet and mud, and cold and heat operating on the skin. In some cases it has been excited by washing the legs with cold water, and not drying them thoroughly.

The symptoms of this complaint are a sudden swelling of the legs. The horse is very stiff and sore, and the legs are hot and painful. In a few days a serous discharge begins to exude through the hair, especially in the regions of the fetlock, knee and hock, and the hair soon comes off in considerable patches. In some cases there is considerable constitutional fever, shown by the staring coat, and quickened pulse. When the exciting cause is kept up, severe cracks appear about the heels, and the swelling of the limbs increases to such an extent that the horse can scarcely move. In other cases the skin between the fore legs and along the under surface of the belly is severely affected.

In the treatment of this complaint the horse should have rest for a few days, then give a mild laxative, and dress the limbs with some mild astringent lotion or ointment.

The disease may be prevented to a certain extent by careful and judicious usage.

Hot Water for Founder.

I had a horse that was very badly foundered with grain. He could not stand for several days, and was swung with a tackle. I thought his case hopeless, and considered him not worth a dollar, but concluded to do what I could for his relief. In the first place, I physicked him; then I took a tight, strong box, got his feet into it, and poured boiling water into it as high as the hair of his feet, and in 10 or 15 minutes he was able to stand on his four legs without the assistance of tackle. I kept up this treatment for thirty-six hours, when he was able to go about and help himself. In a few days I had shoes put on, and in less than a fortnight he was able to work as well as ever.—*Cor. N. Y. Tribune.*

For scratches in horses take white pine pitch, rosin, beeswax and honey, one ounce each; fresh lard, one-half pound; melt well together over a slow fire, stir till quite thick, so that the parts may not settle and separate. This also makes an application for harness galls, cuts and sores of all kinds, on horses and cattle.

Breeder and Grazier.

Size and Weight of Horses for Breeding.

It is always advisable to select horses for breeding that are a little above the average size, for it has been observed that the offspring are frequently smaller than the parents. This is the case especially: 1, when the young colts receive poor care and insufficient food and protection during the first two winters; 2, in years in which the food has been spoiled or made scarce by unfavorable conditions, such as a very wet season, a long-lasting drought or an extremely cold winter; 3, when the growth of the young animal is retarded by disease. Further, where common native horses have been improved by an importation of blood, that is—by a use of thoroughbred or blooded stallions,—we find almost always comparatively more small and fine animals than large and robust ones. Besides all this, the demand for large and heavy horses, that are also good in other respects, is constantly increasing, and is always much greater than for small animals. Therefore a breeder will generally do well, and will find to his own account to select as horses for breeding (both mares and stallions) none that are of inferior size and weight,—provided, of course, the climate, the physical condition of the country, and the quality of the soil do not only permit, but are tending to promote symmetrical development of a big and heavy animal.

Where heavy horses, that are also otherwise well qualified in every respect cannot be had, except at a great expense, smaller animals have to be chosen; but the breeder has to endeavor to increase gradually the size of his animals by bestowing upon his brood-mares and upon his colts the very best care by feeding them liberally, especially with oats, and by giving them ample protection against the inclemencies of the weather. By doing this, he will succeed in raising considerably the average weight and strength of his horses without sacrificing any other good quality already possessed, which latter is so often the case where size and weight are the exclusive aim of the breeders. It is true this method is a slow one; it will take several generations to make the difference in size very conspicuous; but it has the advantage of requiring only a comparatively small capital to begin with.

The thoroughbred horse excels above all other breeds by the great elasticity, firmness and compactness of its fibres, by its noble form of body, by the perfect development of its organs of circulation and respiration, and by a very small size of all minor and comparatively unimportant parts. The common horse possesses much less elasticity, firmness and compactness of fibre, has a less elegant and pleasing form of body, and less developed organs of circulation and respiration, but is generally heavier, and to a certain extent makes up in size and weight what it is lacking in intrinsic power and activity; is therefore better qualified for slow and heavy draught, while the thoroughbred is much better fitted for speed and for travelling over long distances. Hence, where the superior qualities of both of the thoroughbred and of the common horse are harmoniously united in one and the same animal,—where, in other words, blood and size or intrinsic power and weight are combined,—we have a horse that may be called excellent, and will answer every reasonable demand. To effect such a harmonious union must be one of the principal objects of the breeder. It is best accomplished by selecting, first, a large and heavy common mare with good mechanical proportions to be served by as large and half-bred a horse with good mechanical proportions, as can be found, and by matching the offspring, if a mare, with a thoroughbred horse. That favorable results cannot be obtained without proper care, liberal feeding and sufficient shelter does not need any explanation.—*Veterinary Cor. Chicago Tribune.*

Bruising Horses.

A man who will habitually take a horse through a narrow door knows very little of what a horse remembers, or what is fair treatment to the animal. One single blow of the hip against the sharp corner of a doorway is sometimes sufficient to ruin a valuable horse. But when that blow has been several times repeated, the horse becomes valueless, because he has become a highly dangerous animal. We have seen a horse whose hips were never healed after striking two or three times in passing through a narrow way. Another dangerous practice is the leading of horses out of the barn door, by the sides of loads of hay, grain, etc. A slight blow upon the hip will sometimes so excite a high spirited horse that the person leading loses control over him, and he escapes upon the jump, banging his shoulders and hips as he proceeds, leaving patches of skin and hair as evidence that he has got through. Many a valuable horse has been ruined in this way, and many a valuable one can be saved by never leading him through a narrow space.—*New England Farmer.*

Dipping Sheep.

There is given on this page an engraving of a tank and appliances for dipping sheep. This is an operation that ought to be performed at this season on every flock, both sheep and lambs. Vermin which infest sheep greatly increase during the winter. Often

TANK FOR DIPPING SHEEP.

cutaneous disorders, as scab, have largely spread throughout the flock. All these have an injurious if not destructive effect on the sheep and their fleeces. Dipping in various solutions, destroys the vermin and cures skin diseases. The improved condition of the sheep's health acts on the growth of the wool, which becomes heavier and of more even staple. The tank shown in the engraving is a water-tight box just large enough to hold the sheep. There is a false bottom, perforated with a number of holes and suspended by cords, on which the sheep is represented as standing. The cords are wound on the rollers seen at the ends of the tanks. One of the rollers has a crank on one end, and each of them has a grooved wheel or pulley around which a cord is passed. When one roller is turned by the crank the other is also turned, and the sheep is gradually lowered into the dipping liquid in the tank. The sheep is led up the gangway quietly on to the movable bottom, there is no plunging or splashing, and when the dipping has been given, the floor is raised and the sheep's fleece is squeezed free from all superfluous dip, which drains away through the holes into the tank again. The sheep is allowed to depart by way of the sloping platform as quietly as it was brought up. As the dip is used up, the tank should be replenished from a barrel near by. The lambs should be dipped after the sheep are shorn, as then all the vermin will have gathered on to them and may be destroyed with ease.—*American Agriculturist.*

Some time ago there died a large number of horses in Nordheim, Germany, from inflammation of the intestines, the true cause at first not being known. At last it was assigned to the hay, in which, upon close examination, an immense number of microscopic animalcula were found.—They belong to the genus *acarus farinarus*, to which genus the mites living on dry fruit and in cheese also belong. In times of horse diseases it might, therefore, be proper to microscopically examine hay and straw, since even the best fodder, if stored in a damp place, is very likely to be invested with those and other parasites.—*Ex.*

SHORT-HORN INTELLIGENCE.

Mr. Cochrane's Sale of the Duchesses.

From *Bell's Weekly Messenger*, we have the following particulars of Mr. Cochrane's recent sale to Lord Dunmore of 10 Short-horns for $52,500:—

"We can now, on the best authority, give publicity to a transaction, rumors of which have lately been floating about the air, and the importance of which, to lovers of Bates blood in this country, can hardly be over estimated. The exportation of the Duchesses from Wetherby to Canada was a source of no little regret to many Short-horn breeders; and it is therefore with much gratification that we are able to announce their re-importation into this country this summer. It will be in the recollection of most of our readers that they were sold by Capt. Gunter, with a stipulation that they were never to return. Capt. Gunter has now most handsomely withdrawn that stipulation, and made an exception in favor of Lord Dunmore. The only means his Lordship had of securing the Duchesses and Sixth Duke of Geneva, was the purchasing from Mr. Cochrane of his entire Bates herd, as Mr. Cochrane had previously refused to sell Sixth Duke of Geneva, or any of the Duchesses, either singly or collectively. The Dunmore herd will, therefore, be augmented by the following:—viz., Duchess 97 (dam of Duke of Hillhurst sold to Col. Kingscote, and Second Duke of Hillhurst sold to Col. King, of Minnesota); Duchess 101 (Dam of Lord Dunmore's Duchess 108th and his Third Duke of Hillhurst). Duchess 103rd (Dam of Lord Dunmore's Duchess 107th), and Sixth Duke of Geneva, whose reputation as a stock-getter stands so high on the other side, that a well-known American breeder offered Mr. Cochrane 3000 gs. to keep him in the country. The remainder of the herd comprises one Waterloo heifer, and five of the Wild Eyes tribe, the cows of which are in calf to Sixth Duke of Geneva. Duchess 103rd was due to calve to this celebrated sire on the 25th of March, and we believe the result will be "cabled" to Scotland. This is one of the four births expected from the Dunmore Duchesses during the present season. We may, therefore, not only congratulate Lord Dunmore upon obtaining so valuable an addition to his herd, but also the breeders of Bates cattle in having no longer to run the risk of an Atlantic passage when in want of a Duchess bull."

The Preston Hall Herd.

The sale by auction of the Booth portion of Mr. H. A. Brassey M. P.'s herd of Short-horns, also came off last month at Aylesford, Kent. The cows and heifers sold were as follows:—

Welcome Lass, roan, calved May 15, 1865..	$225
Wave Ripple, roan, calved March 16, 1866; Mr. Thomson, Canada.....	315
Water Snowdrop, white, July 26, 1866..	525
Bull calf.....	100
Waterloo Plume, red and white, July 30, 1866; Mr. W. Torr.....	420
Bright Halo, roan, July 10, 1868; Mr. T. H Smith, Australia.....	1,496
Roan bull calf.....	173
Welcome Dawn, roan, July 2, 1868 ...	315
Bright Diadem, red, August 25, 1868.....	1,575
Wave Elf, roan, October 28, 1868.....	325
Weal Bud, red and white, January 18, 1869	577
Bright Cherry, red roan, December 19, 1868	294
Warrior's Crest, red and white, April 24, 1869.....	787
Wave Rise, red and white, May 31, 1869...	656
Bright Ringlet, red, July 14, 1869.....	2,152
Water Crocus, roan, August 18, 1869.....	840
Waterloo Banner, roan, October 12, 1869.	840
Welcome Maid, red and white, October 30, 1869.....	577
Wave Queen, red and white, January 6, 1871	971
War Song, roan, January 15, 1871	268
Bright Duchess, white, June 2, 1871.	341
Waterloo Cherry Duchess, red, August 26, 1871; Mr J Thomson, Canada..	300
Wild Wave, red and white, November 9, 1871 ..	200
Brilliant, red and a little white, November 26, 1871	400
Brunette, red, December 18, 1871.....	314
Wild Spray, red and white, January 18, 1872	395
Wassail, roan, February 16, 1872.	405
Watchful, roan, March 3, 1872...	290
Bouquet, roan, May 17, 1872'..	364
Wreath, red and white, September 20, 1872	604
Wind Wave, roan, November 23, 1872 .	136
Bridesmaid, red, January 18, 1873....	210
Whirlwind, red and white, February 4, 1873	79

The Bulls sold were as follows:—

Bright Duke, red, January 25, 1872.....	368

Berkeley, red and white, April 22, 1872.....	110
Weald King, red and white, July 21, 1872.	95
Bloomfield, roan, October 6, 1872.....	357
Lord Duke, red, October 9, 1872.....	194
Breakwater, red, November 29, 1872 ; Mr.. Gillow.....	163
Welkin, red and white, February 19, 1873..	120

SUMMARY.—*31 cows* realized $17,976, or an average of $580 each; and 7 bulls brought $1,412, or an average of $202 each. The whole sale produced $19,388, or an average per head of over $510

The Sittyton Herd.

Mr. Cruickshanks, of Sittyton, Aberdeen, had his annual sale of Short-horns last month as usual. Thirty-six bulls were sold for $7,607, or an average of $211; and eighteen heifers were sold for $2,520, or an average of $140. The Sittyton herd is supposed to be the largest herd of Short-horns in the world; but though the animals are of excellent quality and the sires are invariably of the highest class, the prices obtained for them fall far short of those realized by English breeders. This arises from the fact that little regard is paid by Mr. Cruickshanks to the preservation of distinct tribes or families in breeding —but all are intermingled in the most defiant manner.

The Ythanside Short-horn Sale.

The annual sale of Short-horns under the auspices of the Ythanside Farmer's Club took place at Ellon last month. Upwards of 60 animals were catalogued, from the herds of Messrs Marr, Cairnbrogie; Thomson, Newseat of Dumbreck; Davidson, Mains of Cairnbrogie; Cowie, Cromblybank; Gray, Barthol Chapel; Ronaldson. Little Gight, &c. The stock on the whole were a promising lot, and embraced not a few superior well-bred animals, most of them being sired from the best herds in the north. There was a pretty keen competition, the average of the whole being $134.

Eccleswall Court Sale.

On the 22 April, the fine herd of Short-horns of Capt. J. E. Winnall, of Eccleswall Court, near Ross, was sold by Mr. Thornton; 75 cows and heifers were sold at an average of $219, and 12 bulls at an average of $150. The 87 animals produced $18,181, or an average of $209 per head The highest price obtained was for *Carolina 7th*, a three year old cow, bought by Col. Kingscote, for $775.

The Holmescales Herd.

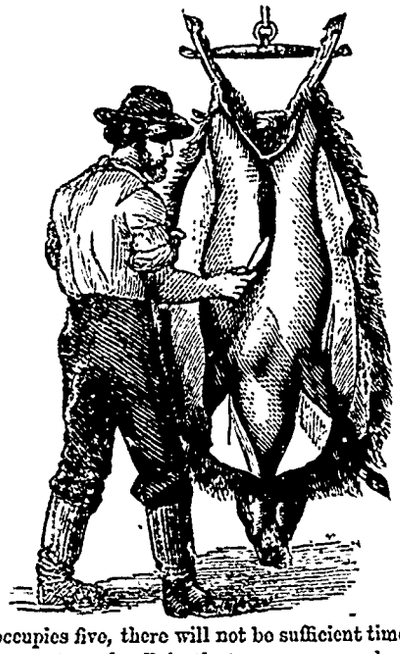
The sale of Mr. H. J. Gibbon's Short-horns was held at Milnthorpe last month when nine cows were sold at an average of $205; and four bulls at an average of $187; total average $200 each. The animals were of superior character.

Economy of Liberal Feeding.

Now that the spring lambs are being dropped, there cannot be too much emphasis given to the economy as well as the necessity of liberal feeding and careful sheltering from rain storms of the mothers both before and after yeaning. One good lamb is worth half a dozen poor ones. In fact the more of the latter the farmer has the worse for him. Good flesh and thrift in the mother insure plenty of milk and consequent strength in the lamb. A good send off for a lamb is half its raising, as it will very soon acquire strength enough to withstand hardships and exposures that is quite sure to cost the life of its puny fellow. If the flock is of any size it will be much the better way to separate the breeding ewes from the dry sheep; and from these when it can be done, we would cull the mothers as fast as the lambs are dropped. Both mother and lamb need more quiet and more attention than they are able to secure when mixed with the flock. Besides this, many ewes for a few hours before lambing, will try to adopt freshly dropped lambs, thus annoying the rightful mother, and tending to confuse matters generally. Such cases need to be looked to, and the ewe that is yet to lamb separated from the others. Considerable inconvenience is sometimes experienced in consequence of ewes dropping twin lambs, when they have no more milk than is required for one. This difficulty can be partially remedied by forcing a ewe that has lost her own lamb to adopt another. If the lamb lost was a very young one there will not be much difficulty. If closeted with the lamb to be adopted, in a dark pen, not more than two feet and a half by three in size, most ewes will "own" a foster lamb inside of twenty-four hours. If the dead lamb was several days old it is best to take the skin from it and tie upon the one to be adopted. Even this will sometimes fail, but is always worth trying. Ewes thus penned may need to be held to allow the lamb to suck three or four times a day; and should be well and regularly fed to keep up the supply of milk.—*Western Rural.*

How to Dress a Sheep.

It may be of interest to some of our country readers to learn how to dress a sheep properly; because a great deal of the flavor depends upon how this operation is performed. We give directions, with an illustration, how to avoid this ill flavor, which arises from the absorption by the meat of the gases from the intestines, which, as the outside of the carcass cools, can not escape, and are, therefore, absorbed by the flesh. There is a simple remedy. As soon as the animal is dead, let the hide be slit up from the brisket to the tail, and to the knees, by a quick motion of a sharp-pointed knife, inserted beneath the skin. Strip the skin from the belly and the ribs and legs, so that it will be out of the way of the intestines. Then open the sheep immediately, and disembowel it. All this ought to be the work of about one minute or two, or



if it occupies five, there will not be sufficient time for the carcass to cool sufficiently to cause any unpleasant taste. Then proceed to strip the skin from the back of the carcass. A sheep should be killed by thrusting a sharp knife through the neck, back of the windpipe, without touching it however, but cutting the arteries; and as soon as the knife is inserted, it should be twisted round as if to make a round hole, there will then be no mistake made in cutting the arteries, and the death of the animal will be comparatively painless and rapid.—*London Cattle Magazine.*

Fatting Hogs.

It not unfrequently happens that hogs put up to fatten show a loss of appetite for weeks at a time, eating but little and wasting a good deal. Messrs. Lawes & Gilbert, the well-known English scientific farmers, have encountered this difficulty more or less, in addition to positive disease, and after many experiments have prepared a compound which they state has been very effectual. The following are its ingredients and the proportions. 20 lbs. finely sifted coal ashes. 4 lbs. common salt. 1 lb. superphosphate of lime. They are duly mixed, and put into a trough where the hogs can have free access to them at all times. In a case where three pigs were troubled with swellings and difficulty of breathing, they consumed 9 pounds of this mixture during the first fortnight, 6 pounds the second, and 9 again during the third. The expense of materials is very light. Those who have occasion to test the prescription would confer a favor on others by reporting the result.

Blind Bridles.

The check rein is not the only objectionable part of a bridle. Blinds, although a lesser evil, are, as a rule, quite as objectionable. The horse should be treated as a reasoning animal. When a colt is first harnessed its fear is greatly excited. The feeling of the harness is new, and tends to alarm the leather bound beast. If, in addition, you blindfold him to all directions save the straight forward, you increase his terror four-fold. He hears the rattle of the waggon, and many other sounds which are incomprehensible. He catches glimpses of passing objects, and fears that in some way he is going to be hurt. Now substitute for the bridle with blinds one without blinds; and see how much his nervousness and terror will abate. His eyes will assure him that nothing is coming at him, and he becomes quite docile. I would make it an invariable rule not to put blinds on a young horse.

The reasons given for using blinds are that they make a horse look better, and that they prevent his springing forward when he sees the whip rising for a blow. Now, I will admit that a poor old crowbait of a horse looks better when put inside of a new harness with blinds on, as the bridle covers up his weary, sunken eyes. But the less you have on a well-formed head, the better for looks whether animal or human. The comfort of an animal should be attained if it can be done merely by sacrificing looks. The second reason has no force, except in one case, that of a four horse team, when you are obliged to use a whip on the leaders. In such a case it might be necessary to put blinds on the wheel horses. But even in this case a little patient teaching would soon overcome all difficulty. A team without blinds jumps no worse at the sight of a rising whip than a blinded one does after being struck. The driver is always prepared for the jump when he strikes. Let him be prepared when he goes to raise the whip, and there will be no more difficulty in the one case than in the other. But never raise your whip without striking. It is like parents threatening to punish their children, and then not doing it. It results in lack of respect in either case, and leads to unnecessary difficulty. In large cities where sights and sounds are very numerous and various, the use of blinds is becoming unpopular, especially among teamsters who are obliged to throw down their lines while loading and unloading. Experience is teaching them that their teams stand better and are less liable to fright if they can see all around them.—*Oneida Farmer.*

Sour Milk for Cows or for Hogs.

We cannot advise the use of sour milk as a feed for milch cows, because such food will be likely to have a deleterious influence upon the quality of the milk yielded by the cows. We have, in the germ theory, an explanation of the manner in which milk is changed from its normal condition and rendered unfit for human food. It has been proven that stagnant water—the water from filthy pools—is alive with organisms, either animal or vegetable, that make it unfit to use or allow cows to drink. It has been shown by the investigation of Professor Law that living organisms can be carried in water through the body of the cow into her milk and retain their vitality. It has been proven by experiment that by feeding cows distillers' slops the yeast plant peculiar to brewers' yeast has been thus conveyed to the milk and has been found growing therein. The acidifying germs in sour whey, when fed to milch cows, retain their vitality in the milk of such cows, causing it to sour prematurely Numerous well authenticated cases are recorded where milk has been injured by the cows breathing the foul odors of decomposed animal matter—the emanations from putrefying carcasses of calves and horses left exposed in the pasture. Hence it must be evident that sour milk when fed to cows must have more or less influence on the milk yielded by the cows, affecting its flavor and rendering it more susceptible to decomposition than it would if this character of food was not given to the cows. But if milk is liable to be injured and tainted from the causes we have named, as well as from a great many other causes, such as unhealthy cows, the various diseases incident to the animals, neglect in the care of dairy utensils, uncleanliness in milking, &c., &c., we increase the difficulty by putting such milk back into

the bodies of the cows to be again used over in the process of secretion, and sowing again the seeds of decomposition for a crop of bad milk.

Again, simply as a matter of profit, we are of the opinion that sour milk can be used with more advantage as a food for hogs than for cows. Sour milk makes a good diet for swine, and in connection with grain is said to give a most excellent flavor to the meat. Indeed it is asserted that no food in connection with grain or meal is better suited for fatting hogs than milk, both for the increase of weight and quality of meat which it makes. It is undoubtedly a good, healthy food for swine, and is better adapted to the making of meat in this class of animals than the production of milk in cows.

The best food for milch cows is good, sweet grass, from upland pastures. It can be produced more cheaply than sour milk, and with the light of our experience and observation we should say that more profit can be realized by feeding such milk to swine than to cows.—*N. A. Willard, in Rural New Yorker.*

The Dairy.

EDITOR—L B ARNOLD, OF ROCHESTER, N Y., SECRETARY OF THE AMERICAN DAIRYMEN'S ASSOCIATION.

Milk.

The varied and extensive uses of milk, call for an intimate acquaintance with its composition and peculiar properties by the parties who produce, handle, and manufacture it, and also by those who consume it. Though one may learn to work by imitation, or by following rules which the experience of himself, or others, may suggest, and meet with tolerable success, yet it must be evident that a full and complete understanding of all that relates to the materials to be dealt with, would give the operator many advantages which he would not otherwise be likely to make available. This consideration would be a sufficient apology for a lengthy chapter on the properties of milk, as more light in regard to them has become a public necessity, on account of the increased commercial importance of milk and its manufactured products. The better the value of milk is understood, the more extensive will be its consumption, as well as the more perfect its production and manufacture; and hence the dairyman should labor with the double purpose of learning all he can in regard to the basis of his own vocation, and of communicating his knowledge to others. A more thorough study of milk ought especially to become more general among dairy farmers; and it is hoped that the following recital of some of the peculiarities of milk, preparatory to treating of its management, will inspire an inclination, in some of our readers at least, to investigate further.

Flesh and blood are so nearly allied to each other in chemical constituents that flesh is sometimes called "crystallized blood." Milk and blood are about as nearly alike as flesh and blood, and hence milk may with some propriety be called *white blood*. The two differ but little in their chemical elements. Their main difference is in their external appearance. Blood contains a little less water, and its albuminoids are in a little different condition from those in milk, Casein in the milk taking the place of albumen and fibrin in the blood. Milk is taken from the blood by the mammary glands with but a slight elaboration; so slight indeed that when the glands become a little enfeebled, as they often do from fever or other causes of debility, the blood globules pass through them and appear in the milk unaltered. We scarcely ever find a case of feverish or tainted milk in which blood globules do not appear. They are not always apparent to the eye, but the microscope seldom fails to reveal them even in cases where the milk is but slightly tainted. But the particles of blood being heavier than the milk, it is not uncommon to find the bottom of the pan or vessel in which tainted milk has stood 24 hours, stained with red, though the appearance of the milk gave no indication of the presence of blood. Blood is perfect nutriment, and milk which is almost perfectly identical with it in chemical constituents, is also perfect nutriment, and hence its dietetical and commercial value.

Milk when analyzed is usually separated into four different parts, besides the water it contains, each of which is a compound capable of further separation. There is no fixed or exact relations between the several parts or compounds of which milk is composed. They vary with the varying circumstances of the cow, and it is rare to find two cows which will give milk exactly alike The milk of a large number of cows mixed together, will, if of average quality, show about the following result in one hundred parts.

Casein	3 25
Butter	3 50
Sugar	5 50
Mineral	0 75
Total solids	13
" water	87

All the constituents of milk except the butter exist not only in a state of complete solution, but in chemical union with the water it contains, and the solution, if divested entirely of the butter globules, is colorless and transparent as water. The white color of milk is due to the endless reflections and refractions of light upon the innumerable butter globules that are mechanically suspended in it, just as ice becomes white when pulverized, by turning the rays of light out of their course, by repeated reflections and refractions.

The butter globules, or, as they are by some called the milk globules, are suspended in the liquid mass and float about in it freely, and whiten every part with their presence They are all round, or rather egg-shaped in form, but in size they are very unequal, varying from 1-2000 of an inch in diameter, all the way down to undistinguishable minuteness. When viewed under the microscope, freshly drawn milk has the appearance represented in the annexed figure 1.

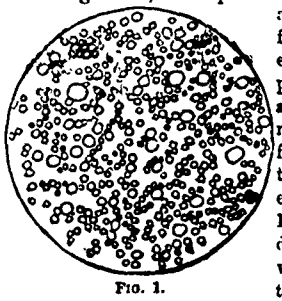


FIG. 1.

Upon the structure and treatment of these infinitesimal bodies depend the dairyman's success in butter-making; and it is important that the operator should be familiar with all that is known in regard to them. A clear knowledge of a few leading facts, and principles, in butter-making, as in everything else, will be found much more efficient in leading to desired results, than the hap-hazard labors and blind imitations of rules made by parties ignorant of the structure and properties of the things they are handling, though the operators may boast of long years of experience.

In searching for ultimate facts in regard to dairying, and especially the department of butter-making, the microscope becomes an efficient and interesting aid, and should be in the hands of every intelligent and progressive dairyman. In examining milk with a strong magnifier, we discover not only that globules of fat matter, of unequal dimensions, float mechanically in the watery mass, but that these little bodies, minute as they are, are made of a speck of several kinds of fat, and in a state of emulsion, with a little curdy matter or casein, and the whole is enclosed within a very thin sack of curd-like matter. If the reader can imagine that the little circles he sees in figure one, are sectional views of the milk globules, they being divided through the centre as one would cut an apple in halves with a knife, the black lines that indicate their circumference will represent a section of the sacks, and the interior will represent the fats it encloses. Now let him bear in mind that the little specks of fatty matter thus enclosed, are composed of white and yellow fats, and several varieties of volatile oils, all mingled together, and that the real diameter of the circles is a thousandth part of their size in the above figure, and he may have something near a correct view of the size and structure of these little globules which play such an important part in dairy husbandry, and which contribute so largely to the luxuries of the table in all the civilized countries of the world.

The envelope of these globules appears to be double, and to be composed of an outer envelope, which is made up essentially of curdy matter, and is comparatively thick, and an inner one which is more oleaginous in its composition, and is very thin and delicate. The outer envelope is what is worn off or broken off in churning, leaving the grains of butter enclosed within the more delicate sack. In one case, the large globules were found to be compound; being made up of several small globules enclosed in one common sack.

Besides the fats and oils enclosed in the globular bodies described, the liquid mass of the milk is charged with numerous oils, so light and volatile as to escape easily by exposure to the air, or by raising the temperature of the milk. These give flavor to the milk and its products, and act an important part in the digestion of the milk when used as food, and also in varying the butter and cheese made from the milk that contains them.

An examination of milk globules with a magnifying glass, serves another purpose in dairy practice which is of no small account. It enables us to distinguish between healthy and diseased milk. Referring again to the figure above, two prominent facts will strike the eye of the observer. One is the even distribution of the globules through the entire figure, and the other is the unequal size of the circles. In all the examples of diseased milk, and illustrations of diseased milk we have met with, the pellicles of the milk globules have appeared viscid and adhesive, as seen in the figure below where the circles will be seen in clusters leaving spaces between them nearly vacant.

Figure 2 represents a sample of slightly tainted milk made so by a little fever in the cow.

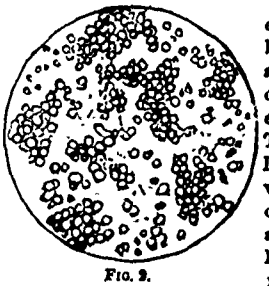


FIG. 2.

One of the very first effects of disease is to begin to decompose and soften the coats of the globules rendering them adherent. This effect will occur long before the cow will exhibit any signs of disease, at least any that would be likely to attract the notice of the ordinary observer. In more advanced stages the globules become broken down and destroyed, and assume a variety of new appearances.

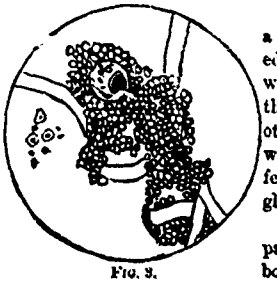


FIG. 3.

Figure 3 represents a sample of milk tainted by drinking impure water. It contained the seeds of algæ and other organic germs, which made the cows feverish and the milk globules very adhesive. The seeds of the algæ passed through the body of the cow into the milk, and after a day or two they grew, and the stems of the plants were seen in the milk well developed as in the illustration. A large germ of another kind lays bare on the adhering globules, and at the top of the figure may be seen some smaller ones of still another variety, and also a few blood cells, having a dark centre. This illustration was

obtained from drawings made by Professor Lane, of Cornell University, who examined the tainted milk.

Figure 4 exhibits an aggravated case of diseased milk. It was drawn from a sick cow in a distillery stable in Williamsburg, at the time of the notorious swill-milk exposition in the city of New York, in 1858 or 1859. The view is taken from a microscopic representation made by Dr S. R. Percy, of New York city, as it appears in the annual report of the N.Y. State Medical Society for 1860.

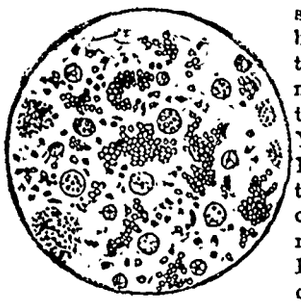


FIG. 4.

The sickness of the cow was very high fever and inflammation of the bowels. The milk was scanty and blue. Under the microscope it showed the milk globules cohering, and also little bunches of them broken down and decaying. Some of the decaying globules showed a yellow color; others of an olive green, and scattering spores of conferv æ. The milk also contained blood globules, which do not appear in the drawing.

From the first two, samples of tainted milk butter could be made, though it would churn with a good deal of difficulty.

From the last, butter could not be derived, though it should be churned a week, but they would all work into cheese, though a less amount would be produced than if the milk were sound. Tainted milk contains less butter and more cheesy matter than healthy milk, and yet all the experiments which have been reported to us have shown that it makes a less quantity and a richer quality of cheese than the healthy milk. This is a result quite different from what would be naturally looked for, but we shall have occasion probably, by and by, to explain the causes which occasion it.

Cooked Sugar-Beets for Cows.

An intelligent farmer informs us that he has wintered five head of cows this season, chiefly on sugar-beets, and has been very successful. The cows gave an average of seven quarts of milk daily from each cow, up to last month, and the quantity now afforded in somewhat under six quarts. The food consumed has been three pecks daily of sugar-beets, sliced with chaff and cut-straw—the whole being boiled together in an ordinary large size farmer's kettle, set on a stove the usual way.

Each cow had two pailfulls of this mess night and morning, with some straw at noon, and the kettle contains enough for two days supply. The cattle are all fat and sleek. The quantity of land sown with beets did not exceed one and one-quarter acre. But the crop was good, some of the roots weighing ten or twelve pounds though many did not exceed three to four pounds. The horses ate them greedily, and as an alterative, it seems to produce high health. The milk realized six cents a quart and consequently the operation has been a most profitable one, on a small scale.

Our informant states that he has carefully compared the result as food for stock of mangels and sugar-beets, both being worked before being fed to the cattle, and he greatly prefers the sugar-beet.

Muzzling Calves.

SIR,—Meeting with a farmer the other day, who had his calves muzzled, I asked his reason for so doing, when he informed me that the cause of death in young calves has been found to be due, in a large majority of cases, to their having sucked and swallowed straws. He therefore applies a leather muzzle to the calves as soon as they can stand, leaving them off until they are a fortnight old. The muzzle (which is cup shaped) is made of some half a dozen pieces of leather strap, crossed in the centre and secured together by a circular strap at the top and adjusted by means of a strap passing behind the ears of the calf. As the rearing of stock is becoming, and likely to become, every day of more importance, I think the matter worthy of note.—*H. S. Harland.*

—The ordinary mode of churning butter in Chili is to put the milk in a skin—usually a dog's skin, tie it on a donkey, mount on him a boy with rowels to his spurs about the length of the animal's ears, and then run him four mile heats.

—The *Journal of Horticulture* says that a French farmer has discovered that the use of tan is an efficient preventive against the potato disease. For three years he has introduced a small quantity of the residue of the bark used in tanning into each hole on planting his potato crop, and each time he has been completely successful in preserving his fields free from the annoying disease.

PAPER CHEESE BOXES.—The Utica *Herald* says that a new cheese box has been brought out in Jefferson Co., made of paper instead of wood, the former being regarded as cheaper than the latter. It is claimed that a paper box is more substantial than the wooden, and as they are lighter there will be a saving in freight by changing from wood to paper. This is an assumption which facts may demonstrate to be unfounded.

HOW LONG TO CHURN.—Some butter makers assert that from fifty to sixty minutes churning is soon enough for butter to curd. This is all well, as talk, but any person who has worked an old dash churn for an hour or more before bringing butter, will protest against this long operation. It is not necessary for the purpose of demolishing the butter sacks and liberating their stores, for this is all churning does. When this is accomplished all is done that churning is designed to do; hence if five minutes performs the operation, why prolong it for an hour? No more butter is secured, and what is got is none the better for an hour's pounding.—*Ex.*

CLEAN THE CHURN!—Much of the bad flavor of butter proceeds from the neglect to properly cleanse the churn, pans or other utensils used, from the sour milk. I have known churns to become so saturated with it that sweet butter could not be made in them. A churn should be frequently filled with lime water or lye to sweeten it, and eradicate the bad odors that have become absorbed into it, or left in some crack of the churn or dash. All pans having creases at the bottom joint should be discarded or the the crease filled up with solder, that the foul stuff may not be secreted there to taint the new milk. Stone pans are excellent, and also the pressed tin without seams. We have frequently found butter to taste as dish-water smells—imperfect washing of pans may be the cause.

USES OF RAWHIDE.—The skin of an animal whether cow, calf, colt, or horse, that dies on the farm is worth more at home than at the tanner's. Cut it into narrow strips, and shave off the hair with a sharp knife before the kitchen fire, or in your workshop, on stormy days and evenings. Ye may make them soft by rubbing. A rawhide halter-strap an inch wide, will hold a horse better, and last longer, than an inch rope. It is stronger than hoop-iron and more durable, and may be used to hoop dry casks and boxes, and for hinges. Try it on a broken thill, or on any wood-work that has been split. Put it on wet, and nail fast. Thin skins make the best bagstrings in the world. A rawhide rope is a good substitute for a chain. It is valuable to mend a broken link in a trace-chain. For some purposes it is best to use it in its natural state. For other purposes it may be dressed soft.

The presence of salt in sufficient quantity protects the animal economy against abnormal changes in its chemical constituents; its deficiency subjects the beast to the attack of disease germs. Dr. Carpenter declares "Chloride of sodium (salt) is needed for the conservation of the organic components of the blood in their normal condition, and Liebig states "that, the other (3 out of 6) oxen, which daily had salt added to their fodder, remained healthy, even in the mode of life to which they were confined, which corresponded but little to their nature; and with excess of food and deficient exercise, their blood remained pure, and well fitted for all the purposes of nutrition. In the salt they had a powerful means of resistance to external causes of disturbance to health, which in the actual circumstances, was indispensable to them." "The body of the others" (which had no salt added to their food) "was, in regard to disease, like a fire-place heaped with the most inflammable fuel, which only requires a spark in order to burst into flame and to be consumed."

Construction of Dwellings.

A person residing in Cincinnati, O., proposes to erect a dwelling after the following plan, and asks if any objection can be seen to it:—

"The foundation having been built in any approved manner, there is to be erected upon a frame-work composed of sills, studding, etc., the same as for any ordinary dwelling-house. This being done, the entire frame is to be filled in with brick-work only four inches thick, care being taken to have this filling flush with the outer and inner surfaces of the studding. The structure is then to be weather-boarded in the usual manner, and the plastering applied directly on the inner side of the filling, it being understood that the studding is to be of the same thickness as the brick-work. The sills will prevent dampness passing up from the foundations into the filling, and the external sheeting will exclude moisture from the joints of the same; thereby ensuring a perfectly dry and comfortable house. The filling, which can be composed of inferior material, will prevent rats and other vermin running through the house; and the said filling will also add greatly to the safety of the structure, as it is well-known that the open spaces between the studding, weatherboards and lathing are simply flues which serve to conduct fire from the lower to the upper parts of the building with fearful rapidity. In case of an external fire, the weatherboards would consume but slowly, on account of their being backed up closely by the brick filling, which would prevent a rapid spreading of the flames. "As far as economy is concerned, such a building would be about as cheap as a frame house with double weatherboarding and lathing, and in some sections of the country, it would be much cheaper. The durability of the structure could not be questioned, as the frame-work would preserve the integrity of the filling and maintain it securely in position for an indefinite period."

Hints about Houses.

Many houses, from the mansion to the cottage, are unwholesome for some of the following reasons

1. Damp basements.
2. Cesspools and foul drains within the basement
3. Rotten timber in floors and skirtings and tainted wall-papers.
4. Kitchen sinks in improper places and unventilated,
5 Water-closets in improper places and unventilated,
6 Rooms without adequate means for ventilation.
7. Water-cisterns and pumps in improper places, and so the water is contaminated.

Houses are also unwholesome from personal dirt, personal carelessness and personal neglect. As when:

1. Rooms are not sufficiently cleaned.
2. Carpets are left down too long and never swept
3. Windows are seldom opened from the top.
4. Closets are dirty, neglected, and without ventilation.
5. Dirty beds are unmade and also shrouded by dirty hangings.
6. Dirty wardrobes and dirty clothes-closets.
7. Nooks, corners and shelves which are never dusted.

Persons who are about to build dwelling-houses should have the following suggestions in mind:

The subsoil beneath a house should be naturally dry, or it should be made dry by land-draining.

The ground-floor of a house should not be below the level of the land, street or road outside.

A site excavated on the side of a hill or steep bank is liable to be dangerous; as external ventilation may be defective, and the subsoil water from above may soak toward and beneath such houses; middens, ashpits, cesspools at the back must taint such basements.

The subsoil within every basement should have a layer of concrete over it.

Cesspools, cesspits, sink-holes or drains should not be formed within house basements.

The ground around dwelling-houses should be paved, flagged, asphalted, covered with concrete, or be prepared and gravelled.

Outside channels should be in good order and be regularly cleansed.

House-eaves should be guttered and spouted.—*Ex.*

Poultry Yard.

The Origin of Brahmas.

The acknowledged superiority of this race of fowls, has of late years naturally caused much attention to be directed to their origin and early history. Their first appearance in England in 1852 it will be remembered, created quite a *furore* among fanciers which was not inaptly designated the hen fever. In that year a Mr. G. P. Burnham, of Boston, Massachusetts, sent over to Her Majesty Queen Victoria, a consignment of what he termed Light Brahmas, and in the following year a number of dark birds to various breeders, and in the year 1855 Mr. Burnham published "A History of the Hen Fever," in which he affirms that the Dark and Light Brahmas had distinct origins, but that he had made them both—the Light, by breeding from some pure uncrossed Grey Cochins; the Dark by crossing Cochins with Grey Chittagongs, of which he says no one entertains a doubt. Mr. Tegetmeir, an English poultry writer, fails in with this view of their origin, or at least does not discredit it. Mr. Wright, a still more recent writer on poultry takes a very different view of their origin, he not only discredits Mr. Burnham's whole story, but has taken considerable trouble to obtain a correct account of their origin, which it would seem he has settled pretty much to his own satisfaction. According to Mr. Wright and the gentlemen with whom he has had correspondence on this subject, it would seem that although Mr. Burnham claimed to originate these fowls only in 1851 and 1852, a Dr. Bennett exhibited the same variety of birds at Fitzburg, Connecticut so early as 1850, which he stated he had purchased from a Mr. Cornish; several other breeders also exhibited Brahmas the following year, all of whom belonged to Connecticut, which State it would seem was the head-quarters or source of this breed. It must be borne in mind that at this time the name of Brahma was not applied to the breed, and it was not, as Mr. Cornish tells us, until at an exhibition held in Boston, in 1850, a committee then appointed gave them the name of Brahma Pootra, it being the name of the great river from the banks of which they came, he having purchased his original birds from a Mr. Chamberlain who had procured them from a sailor in New York in 1846, off one of the India ships. It will be seen then that the conflict of assertion is absolute and direct between Mr. Cornish and Mr. Burnham, and if the former is correct the fowls sent to the Queen were simply mongrels, and not such as we now know as Brahmas. The statement that the two varieties of Brahmas had very distinct origins is known to every breeder of the fowl to be untrue. In the first place, the two varieties, however distinct in color, are still to a great extent interchangeable Miss Watts, whose strain is probably the only British one that has never been crossed, distinctly states that she never had but one stock, from which by selection she has bred both Dark and Light. Mr. Joseph Hinton, another English breeder positively affirms that his birds were originally all Light, but from his stock Dark birds were produced which were prize takers, and this transformation took place within three years.

In urging the view entertained by himself and others, that Cochins and Brahmas were originally of the same stock. Mr. Tegetmeir remarks that it is a fact universally recognized by comparative anatomists, that the distinguished characters of the nearly allied varieties are more strongly marked in the bones of the skull than in any other part of the body Now the skull of the Cochin is vaulted and arched, both from before and backwards, and from side to side, and possesses a peculiarly marked groove, extending from before backwards on the frontal bone; and whatever anatomist will regard as a character of great value, the long axis of the aperture through which the spinal cord issues from the skull is the perpendicular one. Now in these characters, the skull of the Brahma is identical, whereas in all ordinary breeds of fowls the long axis of the occipital foramen is placed transversely; the skull wants the distinguishing frontal peculiarities, and the remarkable arched or vaulted character found in both these breeds." Though it cannot be denied that the Brahma and Cochin are very closely allied races, although not identical, yet it will be seen how little can be based on this argument when we examine further

Mr Darwin tells us that the skull of the Dorking not unfrequently exhibits the peculiar Cochin shape of the foramen and that in some varieties of Bantams the character is almost constant, and that it occasionally occurs in other breeds. The Brahma and Cochin, then, being confessedly closely related races, it is rather interesting to estimate their antiquity; and looking at the various facts simply with the eye of a naturalist, nearly all will be found to favor the antiquity or purity of the Brahma. The pea-comb alone is almost conclusive evidence of this, when considered in relation to the fact as established by Mr. Darwin, that "the very act of crossing gives an impulse to reversion, as shown by the appearance of *long-lost* characters." It has been ascertained that this triple or pea-comb has been found at different times on the pure Malay breed: on (very rarely) the pure Cochin breed; more frequently on the Malay and Cochin cross; on the so-called Sumatra Game Fowl; and on two mongrel birds. One of the latter was about seven pounds weight, black red in color, with olive legs and five claws on each foot, showing very plainly a cross of Malay and Dorking. In each case one of the mongrels (whose parentage was simply undistinguishable) one of the Asiatic breeds was known to be implicated; and in fact it thus appears that each of the great Asiatic races, *when crossed*, and more rarely even when pure, has produced the pea-comb by reversion. The conclusion is irresistible, that this pea-comb belonged to some ancient race of fowls formed no doubt by careful breeding and domestication, and which was probably developed into the Cochin by the Chinese on the one hand, and *possibly* into the Malay on the other, the Cochin branch becoming still more downy in feather and quiet in habits; while the Malay, on the other hand, became closer in plumage and lost the leg-feather, or may even have been formed by crossing back with the *Gallus Bankiva*

The Poultry Yard and the Profits derived from it.

Mr. Kmard B Edwards, South Wales, England, recently delivered an excellent lecture on the above subject, from which we extract the following.—

"That poultry is unprofitable stock, I am quite ready to admit. I will go so far as to say that comparatively few poultry keepers can be said to realize any profit worth considering, and that a large proportion keep them at a loss. But what I wish to show you is, not that poultry must necessarily be profitable, but that under certain conditions they may be made the most profitable stock connected with the farmstead, and that unless I can satisfy you that under the conditions laid down, poultry is capable of returning a very considerable profit, why then I can only advise you to keep as few as possible, and not stultify yourself by keeping a lot of hungry unprofitable birds, which you are ready to admit do not pay An insufficient number usually is kept to make it worth the while of the farmer to give systematic attention to them. Secondly, conscious that they don't pay, they are grudged their food and are neglected; and we all know that any stock which is neglected can't pay Thirdly, the breed of fowls kept has become degenerated by continual crossing and breeding-in-and-in. The size is too small and useless as a meat producer, and its degeneration has reduced the number of its eggs to a minimum. Fourthly, chickens are hatched at all seasons, late rather than early, and fowls are allowed to live past their profitable age—although it is well known that to produce good and profitable fowls they must be hatched early, and not allowed to live beyond that age at which their profit ceases.

We want more eggs and better fowls, and we, the British public, have a right to look to you (the farmers of Great Britain) for the supply of eggs and poultry we are at present obliged to look abroad for. We are daily importing into this country from abroad considerably over one million and a half of eggs per day, or a total of 583,000,000 in the twelve months, and millions of money are annually paid into the hands of foreigners for these articles which the British public have a right to look to you for. I have said that the degeneracy of fowls from continual crossing and breeding in-and-in has reduced the size of our fowls and reduced their egg producing powers. In confirmation of what I say I ask you to go to any country market, and purchase an average couple of fowls, costing say 3s. 6d. or 4s. the couple, put them into the scales, and you will find 5 lbs. will weigh down your precious birds, and it is more than probably that these birds have cost their owners every farthing he gets for them. Now let me draw your attention to what I call a fowl—a bird worthy the attention of the improving agriculturist, and one that when tried in the balance will not be found wanting. Here we have the huge Brahma cocks, Houdan and Creve hens, and Muscovy ducks. Let me ask you to weigh these birds, and you will find the hens average 18 lbs. to 20 lbs. the couple, and the ducks 22 lbs. the couple. Now, I ask you, what such birds are worth—honestly worth—in the market? You may say, Oh, 5s. the couple; a fowl is a fowl—shan't give more! I may also argue with you and say a sheep is a sheep, or a cow is a cow, and I shan't give more; and if I stubbornly refuse to give way to reason, you will find it equally difficult to prove to me that your improved breeds of sheep or oxen are better, or worth more than the little mountain sheep or cattle. I freely admit that such large, weighty fowls cost more to produce them than small ones, but I assert without fear of contradiction that in proportion to their size and value, they do not cost per lb. one-half what the small scampering denizens of the farm-yard cost. Up to the age of two months, the larger breeds costs but little more to rear than the smaller, and the difference of cost afterwards up to the time they are sold, is not much greater. These larger breeds, such as Croves, Brahmas and Houdans, grow far more rapidly and fatten more freely than mongrel stock, and time is money in the poultry business as in everything else. I am quite satisfied that first-class poultry of the best improved breeds can be produced at a cost of about 4 pence per lb., when everything is taken into consideration, and such meat will readily command 10 pence to 1 shilling per lb. in the market, and if this be so, can it be said there is no profit to be realized from poultry. We must now come to the important consideration, as to profit from the production of eggs; it is as egg producers we must look for the chief profit from fowls. I have said degeneracy of breed lessens the egg producing powers of the bird. I think all will admit, who have given any consideration to the subject, that taking the number of fowls of all ages kept on a farmstead, the average number of eggs produced from each fowl does not exceed eighty or ninety in the year. This is the usual estimate given for mixed or cross-breeds of common fowl of all ages. Now it is well known that certain breeds lay more eggs than other breeds; for instance, Spanish are known to lay far more than Dorkings, and Hamburghs far more than either. Keep a breed that shall lay more eggs—in fact, keep those breeds that lay most eggs. Now as egg producers, in quantity, no breed has ever exceeded the Hamburgh, which will average 220 to 240 eggs from each bird in the year; Leghorns and Andalusians we may average at 220; Houdans, 180 to 200; Spanish and Minorcas, 200. When we compare this yield against the eighty or ninety produced by the common fowl, you will readily admit the advantages and importance in a profitable point of view, of keeping a breed that is a known and acknowledged prolific egg-layer. Then again, as to the production of meat; the Houdans and Creve-Coeur are found to attain maturity much

quicker, and upon less food than our common fowls, and the flesh is far superior. The Creve can be reared and fatted fit for the table at the age of ten or eleven weeks, and far surpasses all fowls for the lightness of bone, and delicacy of its flesh Combined with considerable size, and in this respect the Houdan is little inferior to it. The Houdan is the Dorking of France, highly esteemed as a table bird, combining as it does considerable egg producing powers with excellency of flesh. The Brahma Pootra, that huge Asiatic fowl, so hardy in constitution, and so well suited to our variable climate, is fast becoming a great favorite in this country, as shown by the thousands that are now annually exhibited at our poultry shows. *This huge* fowl attains a weight of 12 to 14 lbs. (each bird). Its chief value is however for crossing purposes, as it imparts to other breeds size with great constitutional powers. Such a large bird must necessarily be somewhat coarse in the bone, and owing to this it is much used for crossing with more refined breeds; by so doing its coarseness is reduced, and a superb table bird produced, combining size with quality of flesh, and plenty of it. Again, as winter layers, no breed can excel the Brahmas. They are said actually to lay more eggs in the winter than in summer, and we all know the value of new laid eggs in mid-winter. Another advantage the Brahma possesses is that by being a winter layer, the hen becomes broody in the early spring, at which time chickens should be hatched, and at this time broody hens are scarce, as other breeds are then only commencing to lay, and become broody too late in the season for hatching pullets to lay through the following winter. The great size of the Brahma hen enables her to cover fifteen or sixteen eggs, and she invariably proves herself a good and careful mother. To make poultry really profitable, it is clearly necessary to keep a breed that arrives quickly at maturity, is easily fattened, and attains considerable size, when the production of meat is the object sought, and to gain this end it will be well to set up a stock of Creves, Houdans and Brahmas, and by judicious crossing you cannot fail to produce a large and profitable fowl, very little inferior in size or weight to ordinary market turkeys. When the production of eggs is the object sought—and it is from eggs the chief profit from poultry must be sought—it is necessary that you set up a breed of prolific egg layers, that's worthy of the name of every day layers, or ever lasting layers. Brahmas for winter eggs and hatching; your early chickens; Dorkings, Houdans, Andalusians, Minorcas, Spanish and Leghorns, all or any of these may be kept for the unfailing production of eggs in any quantity; these breeds never desire to sit, but lay continuously until these moult"

* * * * * *

I may mention that careful experiments have been made more than once, and which have proved that the application of 1 cwt. of fowl dung, has equally beneficial effects upon certain crops as 1 cwt. of best guano. Does not this point to the importance of economizing and utilizing the manure of fowls, and especially in cases where large numbers are kept? How seldom do we find the manure of fowls utilized as it should be; as a rule, they are allowed to roost about here and there, and even when confined to a hen roost, how seldom, if ever, is the manure gathered and applied in any profitable way. Fowls should be provided with a comfortable hen roost, and nesting house, and the bottom should be strewed with 2 or 3 inches of dry powdered garden mould. This is a very important matter, as the moist droppings of the fowls fall upon the dry dusty mould the latter has the effect of at once deodorising it and keeping the house sweet.

I beg to conclude, hoping that by drawing attention to this important though neglected branch of agricultural industry, I may induce you to give fowls a fair trial, and I also trust that I have succeeded in convincing you that although it be true that fowls don't pay, it is equally true that they do pay, and that under certain specified conditions they not only pay but actually return a larger profit than that realized from any other farm stock.

Feeding Chickens.

Corn, wheat screenings and occasionally coarse meal, scalded and mixed with hot water, make up their food. I never give them corn meal mixed with cold water, I don't believe in it, in fact I think that it is one source of their sickness and diseases. All their food is better for them cooked but cooking of corn and wheat implies trouble, So it does, but it pays to do it, and does anything pay without trouble? However, let me say, whether you feed on raw corn or no, never feed on raw corn meal.

Now, when I feed, my plan is to walk all over the yard, about half an acre, and scatter the food right and left (two grains never fall in the same spot) and immediately you see the whole army scatter themselves as skirmishers, and the yard presents, for an hour or more, somewhat the appearance of an upturned ant hill. I never give them as much as they can eat, so they always leave off hungry. By my system of scattering the food, old and young, weak and strong, small and large, all get their chance and share, all are kept so busily and actively employed that the very process of feeding stirs them about, and keeps them from being too lazy to move about. *Clean* water (you see I emphasize the clean part) they must have, free to all. Drinking foul water kills more chickens than nine-tenths of us raise Occasionally *in summer* I drop a lump of lime into the water; I also make them cayenne pills whenever I notice them drooping, or their discharges show symptoms of diarrhœa. Gapes come from drinking foul water, living in dirty quarters and want of good food, properly given.

The best cure for this and all other diseases chicken flesh is heir to is prevention—in this case, an ounce of prevention being worth a good many pounds of cure Give them good, wholesome food, healthy, clean quarters, pay some decent regard to their comfort, and, my word for it, they will make you rejoice in the profitable gratitude they return you; you will be but little troubled with cholera and gapes, or any other pest, except the miserable chicken thief, and the best cure for him is a spring gun, properly arranged to dose him when he makes his marauding attempt.—*Cor. Country Gentlemen.*

Profits of Poultry.

Nothing which the farmer produces is of quicker sale than eggs and poultry The prices which he receives therefor are in the main remunerative; the labor incurred is light and agreeable, and can be performed by the junior members of his family. The poultry yard produces food which is highly palatable and nutritious at all seasons, and in this respect is hardly equalled by any other department of the farm. Is it not worth while then to bestow more care and skill in managing the poultry? Left to themselves, half their products are often wasted, and half the year they are non-layers. In winter they need simply warmth, light and sunshine, clean, roomy quarters, and plenty of food. Every day they will pay for this. In the summer they want range, fresh earth, shade, water, seclusion, and protection from vermin. An abundance of eggs and broods of plump chickens, either for market or the farmer's own table will result from this care. It is not feasible to carry on the poultry business on an enormous scale. Many have tried it and failed; but every farmer should make a couple of hundred dollars' worth of their products yearly. That, at least, can be done with profit and pleasure. It is a business adapted for the boys and girls, and they will speedily take a lively interest in it if only proper encouragement is given —*Farmer's Union.*

Getting Plenty of Fresh Eggs.

Thirty years ago I was troubled just as my neighbor now is; I fed my hens plenty of corn and got but few eggs. I reasoned upon the matter, and happened to think that the constituent parts of milk and the white of eggs were much alike Now it has long been known to milkmen that wheat middlings and bran are about the best of any food to make a cow give milk; why not, then the best to make hens lay eggs? I tried it, and since then have had no trouble. My mode of preparing the feed is to mix about five parts of bran with one of middlings. In the morning I wet up with water about four quarts of the mixture in a large tin pan, taking pains to have it rather dry, though all damp. This I set in a warm sunny spot, south of their shed, and they walk up, take a few dips, don't seem to fancy it like corn, and start off on a short hunt for something better, but always coming around in a short time for a few more dips from the dish of bran. There is little time during the whole day but what one or more are standing by the pan and helping themselves. I am careful to mix for them just as much as they will consume during the day. At night, just before they repair to the roost, I usually throw them about a pint of shelled corn, well scattered, so that each one can get but a few kernels. If your hens don't incline to eat this feed at first, sprinkle a little Indian meal on it. I would like all who complain of not getting eggs to try my plan, and I think they will never be sorry.

A Varied Diet for Fowls.

There are no animals more omniverous than fowls; fish, flesh, herbs, and grains being devoured by them with equal relish. We say equal, for though they commonly pounce upon meat with greater avidity than upon grain, this is generally because it affords variety, and the flock kept for awhile almost entirely on animal food will show the same greed for a few handfuls of corn.

Now, those animals accustomed to use a varied diet should not be confined to an unvarying one. There are, indeed, some species which are naturally limited to one or a few kinds of food. Thus, cattle do well enough, although kept month after month on grass alone, and a tiger will thrive with nothing but lean meat upon his bill of fare. But with other animals, as with the human race, for instance, the case is different, for no person can maintain the highest efficiency when confined to one article of food. No matter how fond we may be of a particular dish, we lose relish for it when allowed nothing else for a number of consecutive meals, and the intense craving for variety indicates as its source something more than mere appetite. It gives evidence of the real necessities of the system which are constantly varying with the changing circumstances of weather, employment and other conditions.

The fondness for variety shown by fowls is as significant of real needs as we have found it to be in ourselves. In purveying for them, a judicious variety, selected from the three general divisions—*fresh vegetables, grain* and *animal food*—is at all seasons absolutely necessary for young and old in order to make them perfectly thrifty. True, they will not starve on hard corn and water, neither will they pay a profit so kept.—*The Poultry World.*

How Fowls Grind their Food.

On this subject S. Edward Todd discourses as follows: "Fowls have no teeth to grind or masticate their food with, and the best they are able to do with it is to pick it and swallow it whole. Kernels of grain are swallowed whole by them, and as they are surrounded by a tough pellicle or skin, which the juice of the stomachs of the animals will not readily dissolve or digest, they could obtain no nourishment at all from grain, if this tough pellicle was not broken. Now, if we dissect the gizzard of a fowl of any kind, we find a lot of small gravel stones, which are usually the hardest kind of flint, granite or sand stone. Surely here is a pocket edition of Farm Grist Mills.

Fowls swallow their food broken or not, and it enters the crop or *first stomach*, and remains in it until it has become softened, more or less, when a small quantity at a time, just as grain runs into grist mill is forced into the gizzard among the gravel stones. This gizzard is a strong muscular stomach, and plays night and day, when there is a grist to grind, similar to bellows, contracting and expanding, thus forcing the gravel stones into the grain and breaking it to fragments, and triturating the whole mass; after which it is in a suitable condition to be quickly digested.—*Farmer's Union.*

Dressing and Trimming Fowls for Exhibition.

Black Spanish must unfortunately be trimmed in the white of the face, specially pulling out the hair-like feathers that intrude between the white of the face, close up to the base of the comb, producing by this plucking, the extraordinary height and breadth of white which is seen in the prize birds. They must be washed two or three times a week with a little curd soap and chilled water, and bathe all off with clean chilled water. The legs simply require washing to remove any dirt. Brahmas, either dark or light, should be bred so that they may be shown without requiring to be trimmed, as they are treated with more rigor in that respect than either Spanish or game; it is necessary to wash the legs and feet of both colors; endeavor to house and provide for them so that the bodies of either do not need washing. The same applies to black Creve cœurs. There is no trimming required in well-bred birds. Fowls thrive well on a change of food, therefore give them some of every kind in change. No specified quantity can be given; they should have sufficient thrown down to them, and so soon as they appear to have had enough do not give more. Never allow food to remain upon the ground; it is wasteful, and only attracts rats, mice, and sparrows. Smash the bones about the size of split peas, and give about a teaspoonful each, twice a week.—*Cor. Land and Water.*

Advertisements.

FARMERS!

USE THE

BONE SUPERPHOSPHATE,

MANUFACTURED BY

The Western of Canada Oil Lands and Works Co.

It is the best fertilizer now in use. Read testimonials from parties who used it last year:—

LONDON TOWNSHIP, 4th CONCESSION, January 23, 1873.

GENTLEMEN,—I have pleasure in reporting to you the improvement on my land by using the Bone Superphosphate. I gave it a trial on four acres of clay soil, that was completely run out and impoverished. I used the Bone Superphosphate on one lot, wood ashes on the second, and barnyard manure on the third, on young grass. The result was decidedly in favor of the Bone Superphosphate; so much so that I shall take a much larger quantity from you on the coming season. I am yours, &c.,

CHAS. PRIDDIS.

LONDON, Ont., Jan. 21, 1873.

GENTLEMEN,—Having used the Bone Superphosphate manufactured by the Western of Canada Oil Lands and Works Company, I can bear my testimony to its excellence as a good fertilizer. I tried it on grass-land, celery, and also on the green-house plants. The result has surpassed my expectation, particularly on the celery plants. I can gladly recommend its use to any that have not already used it. I am, yours obediently,

JOHN BARRON,
Gardener to the Hon. John Carling.

SPRING BANK, WESTMINSTER, March 13, 1873.

GENTLEMEN,—The ton of Superphosphate I purchased from you last season I applied to grass lands, and was well pleased with its effects, notwithstanding the very dry and unfavorable season. I am convinced of its being a valuable fertilizer. Yours truly,

JOHN B. TAYLOR.

LOT 6, CON. B., GORE ROAD, LONDON, ONT., March 12, 1873.

GENTLEMEN,—The bone Superphosphate I purchased from you last spring was used on "CORN." The yield was fully one third more where the bone Superphosphate was used, and was better in color and quality. I expect to derive equal benefit by using it on my wheat this spring. It is the best artificial manure I have ever seen. I am, yours respectfully,

GEORGE PLAXTON.

WESTMINSTER, Feb., 1873.

GENTLEMEN,—I have used your Superphosphate on grass lawns and on green crops, flowers, &c., and found it very beneficial. As a fertilizer, there is no question it is the best known to science. Yours truly,

W. Y. BRUNTON.

Testimonials from other scientific and practical men will be inserted in next issue.

The Superphosphate is put up in good barrels, containing about 225 pounds each. Price, $40 per ton. It is also put up in bags containing 50 and 100 pounds each at the same price. No charge for bags or barrels. All orders will receive prompt attention. Address,

WESTERN OF CANADA BONE SUPERPHOSPHATE WORKS.
LONDON, ONT., CANADA.

NOTICE TO FARMERS.

MANURES FOR SALE.

Lamb's Superphosphate of Lime, $40 per ton.
Half inch Bone Dust, $20 per ton.
Delivered free of charge at railway stations here.
Terms, cash to accompany orders.

PETER R. LAMB & Co.,
Manufacturers, Toronto.

$5 TO $20 per day. Agents wanted! All classes of working people, of either sex, young or old, make more money at work for us in their spare moments, or all the time, than at anything else. Particulars free. Address G. STINSON & CO., Portland, Maine.

v-10.9-e.o.t.-1-y.

Stammering permanently cured by Bates' Patent Prize Scientific Appliances. They received gold medals at the last London, Paris and New York Exhibitions, and are favorably noticed in the London *Illustrated News* and *Medical Times*.

For pamphlets and drawings describing the same, address

SIMPSON & CO., 45 BOND STREET, NEW YORK.

SEED POTATOES!

EXCELSIOR,
WILLARD'S SEEDLING,
BREEZE'S PEERLESS,
CLIMAX.

For sale by THOS. DRYSDALE & Co.,
29 West Market Street.

v 10-7-3t. Toronto.

DURHAM BULLS FOR SALE.

The following Pure-bred Short-horn Bulls are offered for sale for cash or approved notes, at six months, with interest; and may now be seen at BOW PARK, three miles from *Brantford*, Ontario:—

The Imported Booth Bull, **KING OF THE OCEAN**, [1619], 8465, bred by Mr. Richard Chaloner, King's Fort, Ireland; and imported by Messrs. Walcott & Campbell, New York Mills, N. Y.; Roan, calved 6th July, 1869, Got by *King Richard* (26583), dam *Fair Maid of Hope*, by *General Hopewell* (17953), g. dam *British Maid* by *British Prince* (14196), &c., &c.

OXFORD CHIEF [1911]. Red, with a little white, calved 1st April, 1867; got by *Bell Duke of Oxford* [830], dam *Necklace*, by imported *Prince of Wales* [578], 5100, (13030), g. dam *Mary* (imported), by *Sir Charles* (13705), &c., &c.

RED KNIGHT [2106]. Red; calved 22nd July, 1871; got by *Captain Graham* [1076], 7650; dam *Young Rose*, by *Canadian Punch* [103], 5415, &c., &c.

CUPID [2497]. Red and white; calved 29th August, 1871, got by *Candidate* [1088], 11196; dam *Haidee*, by *Lord Duke* 2nd [1674], &c., &c.

NELSON [1842]. Red and white; calved 20th October, 1871; got by imported *Gr. Duke of Gordon* [1496], 11216, (28787), dam *Mountain Daisy*, by *Garibaldi* [251], &c.

LORD RODNEY [1707]. Roan; calved 1st November, 1871; got by imported *Gr. Duke of Gordon* [1496], 11216, (28787), dam *Hebe*, by *Lord Duke 2nd* [1674,] &c.

THE DUKE OF OAKLAND [2330]. Red and white; calved 3rd December, 1871; got by imported *King of the Ocean* [1619], 8465; dam *6th Duchess of Oakland*, by *Plantagenet*, 7631; g. dam *4th Duchess of Oakland*, by *Duke of Thorndale*, 2787, &c., &c.

ROYAL WINDSOR [2302]. Rich Roan; calved 10th Jan., 1872; got by imported *King of the Ocean* [1619], 8465; dam *Famosa 2nd*, by *Udora's Son of Grand Turk*, 6205; g. d. *Famosa*, by *Neptune* (11847), &c.

PRINCE LUAN [2060]. Roan; calved 20th Jan., 1872; got by imp. *King of the Ocean* [1619], 8465; dam *Princess Luan 2nd*, by *Eleventh Duke of Thorndale*, 5611; g. d. *Princess Luan*, by *Prince of Bourbon* [568], 7111, &c.

GEO. BROWN.

BOW PARK, 10th May, 1873.

THE WHEAT FIELD OF AMERICA!

Healthful Climate, Free Homes, Good Markets.

THE NORTHERN PACIFIC RAILROAD offers for sale its **Lands in Central and Western Minnesota**, embracing: 1. The best Wheat Land; 2. Excellent Timber for the Mill, the Farm and the Fire, 3. Rich Prairie Pasturage and Natural Meadow, watered by clear Lakes and running streams—in a Healthful Climate, *where Fever and Ague is unknown.*

Grain can be shipped hence by lake to market as cheaply as from Eastern Iowa or Central Illinois. Cars now run through these Lands from Lake Superior to Dakota. Price of land close to track, $4.00 to $8.00 per acre; further away $2.50 to $4.00. **Seven Years' Credit;** Warrantee Deeds; Northern Pacific **7-30 Bonds**, now selling at par, received for land at $1.10. No other unoccupied Lands present such advantages to settlers.

SOLDIERS under the New Law (March, 1872), get 160 acres FREE, near the Railroad by one and two years' residence.

TRANSPORTATION AT REDUCED RATES furnished from all principal points East to purchasers of Railroad Lands, and to settlers on Government Homesteads. Purchasers, their wives and children **carried free** over the Northern Pacific Road. Now is the time for Settlers and Colonies to get Railroad Lands and Government Homesteads close to the track.

Send for **Pamphlet** containing full information, map and copy of New Homestead Law. Address,

LAND DEPARTMENT NORTHERN PACIFIC
RAILROAD, ST. PAUL, MINN.,
OR 23 FIFTH AVENUE,

v4-7-12t COR. 9TH ST., NEW YORK.

USE

PARK'S COTTON WARP!

The best in the Dominion.

Full length and carefully numbered. For sale by all Dealers.

ALEXANDER SPENCE,

4-v9-1yr Montreal, Agent

SUPER-PHOSPHATE OF LIME.

PRICES GREATLY REDUCED!

This grand substitute for Barnyard Manure is patronized by the Minister of Agriculture, and the leading Farmers, Gardeners and Florists.

It suits any kind of land, and any kind of crops.

It is invaluable as a top-dressing for Fall Wheat after a severe winter. It will double the hay crop, and is a specific for all root crops. It takes 300 lbs. per acre for an ordinary crop, costing not much more than the expense of hauling and spreading manure in a busy season.

It is manufactured at the Brockville Chemical and Superphosphate Works, Brockville, from whence it is shipped in bags to any point. (Low special mileage rates.

Send orders to

Alex. Cowan, Manager,
BROCKVILLE,

or to

Clarkson & Munro,
v 10.8-3-t EXCHANGE, TORONTO.

CONTENTS OF THIS NUMBER.

THE CANADA FARMER is printed and published by the GLOBE PRINTING COMPANY, at 26 & 28 King Street East, TORONTO, CANADA, on the 15th and 30th of each month. Price one dollar and fifty cents per annum, *free of postage.*

GEORGE BROWN, Managing Director.