Technical and Bibliographic Notes / Notes techniques et bibliographiques

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

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

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

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

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

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. XIII.—No. 7. PUBLISHED MONTHLY. } TORONTO, CANADA, JULY 15, 1876. { $1.00 Per Annum. SINGLE COPIES TEN CENTS.

Agriculture.

Inoculating Grass Land.

The extreme difficulty of forming good permanent pastures on arable lands has recently met with a rather novel solution in England. Instead of the usual fallowing, seeding-down, top-dressing &c., a system of inoculation has been tried, that is, transplanting sods from natural pastures to the ground prepared, and locating them at distances of from one to two feet apart, thus obtaining enough from one acre to sod ten or twelve. When first introduced, the system was attended with considerable expense owing to the amount of labor it entailed. The sodded meadow was cut and cross-cut, the sods then lifted in pieces of about a foot in length by four inches in breadth, and again cut into lengths of four inches before they were transplanted. Recently however, the Duke of Manchester has introduced an improved system of operation which obviates cross-cutting altogether, and consequently reduces the expense of inoculation from about £4 10s. to £3, ($15) per acre. The novelty in the Duke's system consists in cutting out narrow strips of turf, instead of long mats to be re-divided afterwards; and it is a decided improvement on the system of "cut-crossing" squares of 4 inches wide. The implement used may in its frame-work be a common scarifier, in which are fixed two bent rectangular tines, which are so adjusted as to cut a strip of sod 2 inches deep and 2 inches broad. These tines cut out ropes of turf which may be of any length, and may break in lifting into the cart into any size, for they would seldom break in shorter lengths than 2 inches at least. Instead of having to cut them into small squares by the spade or other means, which considerably increases the amount of labor, the ropes of turf are readily broken off in suitable sizes by the hands of the women or boys carrying them during the process of plantation. Of old, also, the usual way of marking the land into lines for transplantation was by the use of a scarifier. The introduction of corn-drills allows of a more rapid means of marking the land, by scoring it with the coulters of an empty drill. The women and children at Kimbolton, having these lines 9 inches apart to guide them, use their own judgment in placing the bits of turf at proper distances—irregularly, of course, yet still, as a whole, carefully and systematically done. The small pieces of turf are pressed down with the foot after they have been placed in position by the hand, and the whole is rolled over soon afterwards, and again at any time it may be deemed necessary, as usually advised when inoculation is practised.

When to Apply Plaster of Paris.

EDITOR CANADA FARMER.—In the May number of the CANADA FARMER there is an article on plaster of Paris. A., B. and C. have experimented and have arrived at different conclusions as to its action on the soil and its value as a fertilizer. I, too, have experimented largely, and have arrived at a decision which is, I think, at variance with all their conclusions. The action of plaster on the soil is different from that of any other manure. All manures except plaster have a tendency to render the soil dry and porous, while plaster makes it damp and compact. It acts as a fertilizer chiefly by drawing moisture from the atmosphere to the roots of plants. Some time ago while cleaning out an old house, we came unexpectedly on a barrel of it. The house had the earth for a floor, but the roof and sides were water-tight. The barrel had no bottom in it. The floor around the barrel was quite dry, but the plaster, strange to say, was as wet as water could make it, but perfectly fresh and good; and, though it had lain in this condition for at least twelve years, had the full weight of newly ground plaster. These facts do not appear so strange when we consider that plaster is simply ground stone, that all stones draw dampness, and that they do not decay. I believe plaster will lie in the earth for a number of years in almost the same state as when applied.

Plaster, if properly used, has a marked effect on the crops for a number of years. It should not be applied more than once in five years. If it is applied often it does an injury. I have heard farmers say that they had applied it to fields till they would raise nothing. It should not on any account be applied very early in spring, and it should not be applied unless the ground and grass are thoroughly wet with rain. Three barrels may be applied to a field of ten acres; or two barrels mingled with about the same quantity in bulk of wood ashes. Plaster may be used on all kinds of land, but I would recommend its use especially on poor and exhausted farms, as it increases enormously the quantity of straw, and thus enlarges the yearly manure heap. It is most effective on peas and clover.

WYMBOW

Leaves from Farming Experience—No. 10.

Feeding and Dairying.

In April and May they got a little bran or bruised oats daily; they were watered once every day; put on grass about the 20th of May; fed all summer by themselves, and housed the first cold or wet nights; fed all winter and spring same as the winter before; pastured by themselves as last year, and housed the first cold nights in October. As they will come in calf divide them into two houses, and about the new year tie them into stalls and card them. Handle them kindly and often, and they will not kick. The cow should have a calf at two years old or less, and should cost about $34. She is now put among the other cows, and should give 13 or 14 quarts of milk daily until near the first of November. Then it will begin to fail. In January the young should get a warm drink every day, better twice daily, of bruised oats, salt and water, and should be milked as long as she will give any. Next year she will give you about 18 quarts daily for the first six months after calving, and more the following year. Selected cows fed as stated in this paper, and about 1,000 to 1,100 pounds in weight, will give 4,000 wine quarts of good milk, and make 13 tons of manure during the year. Of many different kinds of food used, hay, bruised oats, and peas, appear the best for both cheese and butter, and hay and oilcake the worst. Milk may not be mixed with water designedly, and yet there may be 2½ per cent. more solid matter in one cow's milk than in another's. Experiments show that butter varies from the same cow's milk from 3 1/8 to 6.7 1/2 per cent., according to the kind of food, or one man might take 2½ lbs. of butter out of every 100 lbs. of milk, and yet his cheese be better than his neighbors. But suppose that less than half that weight, or one pound of butter be taken from every 100 lbs. of milk, which would help to pay for the grain used as food, and leave as much butter or more in the cheese than is found in good factory cheese by the usual way of feeding. By this practice there would be a profit made on each cow of about $14 more than is made in the usual way of manufacturing the milk. There does not appear to be so much difference in the amount of caseine in milk, only about one per cent.; the price of cheese has not varied much these many years. The price from the farmer, selling in Glasgow bazar, was from 5½d. to 6d. sterling, per pound, for Dunlop or Ayrshire sweet milk cheese. Skim milk cheese was 3d. per pound in August 1821 The average price of good cheese may be 11½ cents, and of butter 22 cents per pound. Twenty pounds of sweet milk will give two pounds full milk cheese, 22½ cents. From 18 to 22 pounds of milk is expected to give 1 pound of butter at 22 cents, but it will take 25, or more, pounds of poor milk to make one pound of butter. Twenty pounds of milk of a good cow, fed on 30 pounds of good hay and 9 pounds broken oats or corn, may be expected to yield one pound of No. 1 butter, so that at these prices, 20 pounds of milk are of about the same value, either in butter or cheese. Milk should be tested to find whether a cow is good for butter or not. About one-fifth by weight of milk should be cream, or in 20 pounds of milk there should be four pound of cream, two quarts, or one pound of butter. When we made butter in summer and the temperature over 55°, the pans were placed on the clay floor of a large cellar in a stone house, well aired. When the temperature is below 55°, the milk pans should be placed on a shelf two feet above the floor. The temperature should be over 50 degrees. When the weather got cold and cheese-making was stopped, I took out the upper part of the cheese vat and set in the pans of milk into the lower part, two gallons or more in each pan, and let on the heated water up to over 90°. In the morning the milk was cold, and the whole of the cream up. The cream was put in a vessel and well stirred. The next cream was added to the first and stirred. It was partly covered to keep out flies, and a crust gathering on the top, we added cream, stirring it often until there was enough to churn. If it was not sour enough we stirred among the cream some acid buttermilk, then let rest 6 or 8 hours, then drew out a spile at the bottom of the vessel. A quantity of bitter, bad-smelling water escaped, enough to spoil a large quantity of butter. If the cream was too thick, we tempered it with water. The temperature to begin with is different according to the way it is to be operated on. If to be done by hand, stopping sometimes, the temperature may not rise, but rather fall. The heat at the first may be 58° and not rise over 65°, time 1¼ to 2 hours. If made by horse or cow or ox-power, if the plunge churn is used, going at the rate of 45 double motions per minute, experience makes the best temperature at the beginning 53½° and when done, 57½°, time 75 minutes; quantity of butter, 2¾ lbs. from one gallon of cream, of the very best butter.

Wire Fencing.

There are many localities where no materials suitable for making fences can be obtained at a cost which will admit of their use by the farmer. Wood and stone are the materials most generally employed for this purpose, but these not being universally abundant, sometimes substitutes are greatly in demand. Hedges will do, but it takes too much time to produce them, if a man is in a hurry to get a secure enclosure. Iron wire is now being employed quite extensively for fences, and if not too small, and then well sustained by strong posts, it answers very well. Many a wire fence, however, has proved to be of little use in turning stock, owing to the lack of proper materials being employed—the idea of cheapness having led the builder to overlook the more important merit of efficiency.

We lately saw a specimen of wire fencing in Philadelphia, which seemed to combine both the useful and ornamental in a greater degree than any other which has come under our observation. It is composed of a top rail of gas pipe, iron posts and six strands of galvanized cable wire passing through the posts. This cable or double-strand wire is not only fully as strong as a single wire of the same weight, but the twisting adds elasticity, which is quite important, especially when iron or stone posts are used in the erection. This cable fencing is of course more expensive than the common single wire, but it is enough better to pay for the additional cost. In answer to an inquiry in regard to the cost of this cable fencing, we have received the following reply:

In answer to your inquiry of a few days back, relative to the cost per rod of our cable fencing, if made with 2 and 3 cables high, I beg to state that the wire alone of our usual quality, made of 5 strands of wire twisted into cable form and thoroughly galvanized, will cost 11½c. per foot,

running measure A fence of 3 cables in height would cost for wire cable alone 7½c. per rod, and the staples and screw-eye bolts for fastening to posts and straining the wire would increase the cost about 1 to 2c. per rod. If only 2 cables high the wire cable alone would cost 49c per rod. This cable wire is heavier and of better quality than is necessary perhaps for herding purposes and is used largely for permanent fencing, and when properly erected lasts for a life time. We could furnish a lighter article unquestionably, made of only 3 wires properly twisted, that could be sold for perhaps one-third less money, in large quantities.—*Rural New Yorker.*

Wheat Bran Nutritious.

Chemists have long believed that wheat bran contains much material for making animal blood and flesh. The analysis of wheat bran and flour, by Dr. Hubbell, a noted pharmaceutist of Philadelphia, presents these facts. One hundred pounds of wheat yield 76 pounds of flour and 20 pounds of bran. The flour holds in it of tissue-making elements—gluten, albumen, etc.—1.65, of phosphates and other salts, 0.70—total 2.35 per cent. The bran contains of tissue-making elements, 3.10; salts, phosphates, etc., 7.05—total 10.15 per cent. The bran is, therefore, four-fold more nutritious than flour, or being but one-fourth as heavy as flour, it has in fact as much real value, as a food, as flour itself. Wheat flour from the mill consists mainly of starch, the blood-flesh-and-bone forming materials or elements of the grain are rejected in the bran because of the ignorant opinons of other generations. According to this high authority wheat bran constitutes a decidedly important article of food, whether for man or beast.

It is a well established fact that bran is more easily digested than flour, but this does not prove that it is a healthier bread. Such facts as these are apt to be too lightly regarded, but they are entitled to the confidence of the people, because chemistry has now advanced so far that the primary life-sustaining elements of all food are as well known as any kind of facts. Farmers should note these facts and make experiments in the manner of preparing bran as a food for stock. The fact that most animals are fond of wheat bran is pretty good evidence of its value. The instincts which nature plants in animals are almost unerring.—*Live Stock Record.*

New Weeding Machine.

The *North British Agriculturist* describes a new weeding machine, lately introduced into Britain from Denmark. It says: The implement is an easy draught for one horse, and is very simple in construction, taking in about 4 feet 6 inches at the time. The body of the machine consists of a revolving sort of drum, into which are fastened three rows of long sharp steel teeth, or combs, as they have been called. The implement moves smoothly on a wheel at each end of this drum, and the horse, yoked in a pair of shafts, speeds along easily right in front of the draught.

The main purpose of the machine is the removal of weeds, such as wild mustard or charlock growing among corn, and it is claimed for it that when the ground is soft it will eradicate the weeds, and in other cases cut the heads off—in either case destroying the weeds.

The three rows of teeth or combs, of course, revolve with the drum, and the teeth are so arranged that they pass scathelessly through the corn plants or blades, but are close enough to secure the weeds. The plan adopted for the cleaning of the teeth is very ingenious, and apparently works satisfactorily. A sort of cam, working in an eccentric groove, keeps the teeth out at full length for two-thirds of the drum's motion round while it pulls in the teeth in the course of the other third and during the pulling-in process the combs are most effectually cleaned. The drum and combs can be speedily elevated or lowered to suit the crops on which the farmer may have to operate.

The machine seems ingeniously designed, substantially made and well-finished, but its price—from £24 to £28—looks rather high. Possibly, however, it may by-and-bye be brought out at less money. As it was only taken to this country last year and has not yet been much tried, there have not been many sold yet, but we are informed that it has been favorably received in Continental countries, and some hundreds are employed in Denmark, Sweden, Norway and Germany. Lord Kinnaird, with a keen eye to anything in the way of agricultural advancement and improvement, with a characteristic desire to introduce and demonstrate the utility of labor-saving machinery, has, we believe, already secured one of these machines, and will no doubt have it fairly tried during the present summer.

Mowers and Reapers.

Values of the Points

The following are the values given to the points of mowing and reaping machines at the international field trial held in Bucks Co., Pa., during June and July. The points were arranged under five heads, grouped into three divisions, those under each division being first determined by a separate sub-committee of experts, then submitted to the full committee, and finally reported to the international jury Total number of points, 29. Total value of points, 1,000.

Division A, construction and durability

Construction.

1. General harmony of parts	85
2. Adaptation of parts	80
3. Mechanical construction of parts	100
4. Simplicity of construction	110
	275

Durability.

1. Materials and strength of parts	80
2. Combination of parts	45
3 Provision for compensating wear	23
4. Facility with which parts broken may be replaced	25
	175

Division B, work; and safety and ease of management.

Work.

1. Quality of work	125
2. Variety of work	55
3. Adaptation for work	35
4 Speed - fast or slow	10
5. Width of cut	5
6. Freedom from noise	3
	233

Safety and Ease of Management

1 Safety to driver	40
2 Safety to horses	15
3. Position of driver's seat, foot rest and levers	25
4. Facilities for backing and turning corners	20
5. Facility for regulating height of cut	35
6. Ease of transfer	10
7. Accessibility to parts	30
	175

Division C, draft.

Draft.

1. Power required to draw machine, out of gear	5
2. Power required to draw machine, in gear	5
3. Actual power required while cutting	120
4. Proportion of weight made available to driving knife	10
5. Extreme vibration of dynamometer needle while cutting	25
6. Irregular draft	30
7. Side draft	20
8. Weight on horses' neck while cutting	10
	225

The drafts as indicated by a self-registering dynamometer, having the value 120 in the scale of points, were expressed in numbers of that scale, and not merely by the number of traction pounds, as is usually done.

To convert these pounds into points of the schedule, the machine having the lightest draft of all those of its classes when cutting was rated at the full number—120 representing its value on the scale adopted; other machines ranging below it according as their draft was greater. Their true position in the scale under this head was then ascertained by inverse proportion. Thus, suppose the number of traction-pounds of the machine of the lightest recorded draft 94 lbs, and of two other machines 130 and 190 lbs., respectively; then on the scale, the machine of lightest draft would stand 120; the standing of the second machine by the proportion 130 : 94 : 120 to the number sought, 87. For the third machine the proportion would be 190 . 94 . 120 to the number sought, or 59. The numbers 120, 87 and 59 representing, on the scale of points, the traction-pounds, 94, 130 and 190 recorded by the dynamometer.

Value of Manures.

Dr. Sturtevant gives in the *Scientific Farmer* the following estimate of the value of cow dung and horse dung and their equivalents in chemicals.

COW DUNG.

	Cart load.	Ton.	Cord.
Nitrogen	6.46 lbs	7.60 lbs	30.40 lbs
Potash	6.12 lbs	7.20 lbs	28.80 lbs
Phosphoric acid	2.72 lbs	3.20 lbs	12.80 lbs

HORSE DUNG.

	Cart load.	Ton.	Cord.
Nitrogen	7.42 lbs	10.60 lbs	23.85 lbs
Potash	7.14 lbs	10.20 lbs	22.95 lbs
Phosphoric acid	5.74 lbs	8.20 lbs	18.45 lbs

Calling phosphoric acid worth 12 cents a pound, potash 6 cents, and nitrogen 25 cents a pound, we have the following values:

	Fresh horse manure.	Fresh cow manure.
Cart load	$2 80	$ 2 24
Ton	4 13	2 63
Cord	9 30	10 54

The amount of chemicals which would answer to the chemical equivalent of this dung, is as below for stable dung. We could take for the cord.

132 lbs. pure superphosphate at $10 ₱ ton, =	$2 64
183 lbs. dried blood at $60, =	5 49
43 lbs. muriate potash at $60, =	1 29
Total 358	$9 42

OR

	Nitrogen	Phos. acid.	Potash.
184 lbs. refined guano, =	5.5 lbs	18.4 lbs	3.6 lbs
141 lbs. dried, =	18.4 lbs	....	....
37 lbs. muriate potash, =	....	....	19.2 lbs
Total 362	23.9 lbs	18.4 lbs	22.8 lbs

Of a value of $11 32.

From these tables a farmer may learn much—the value of manure of the best quality, and its value as compared with fertilizers; always bearing in mind the cost of application. Also the necessity of using head work in buying fertilizers so as to obtain the most for his money. A little carelessness here may cost much. In the two calculations given, we have the same quantity of valuable ingredients; costing in the one case $9 42, in the other $11 31—a difference of $1 90. Sufficient pay, indeed, for a few moments of study.

Oil the Harness.

Have your harness repaired, if necessary, before a drier season sets in. Wash it thoroughly with warm soft water and Castile soap, and brush out every particle of dust before putting on the oil. This is the important point. Better not oil at all than to apply it on dirty leather. The harness should be taken apart and the pieces washed and oiled separately Rub on the oil while the leather is softened with the water. It can be applied at once if the leather is rubbed a little with a dry cloth; it should be soft, but not too wet. After applying the oil, hang up to dry for a few hours, till the oil is absorbed. Old harness that has been neglected and is dry and hard, had better not be oiled; it will do no good, the evil is already done. The fibres of the leather have lost more or less of their tenacity, and oil will not restore it; in fact, by softening the leather it only weakens it, just as a wet sheet of paper will tear more easily than a dry one. Oil does not add to the strength of leather; it merely softens it and keeps it from cracking; it is a preventive of decay—not a restorer, Harness are now so high that it is more than ever important to take good care of them. Never let them suffer for the want of oil; keep in good repair and they will last as long again.

Getting Rid of Twitch Grass.

I find the best way to be rid of this grass is the most thorough way, where it pays to fight it vigorously, as in a garden—upon the farm, where it competes with farm crops, a more prolonged fighting may be allowable. But wherever there is much of hand labor, we must rid ourselves speedily of this grass, and the thorough and efficient course to this is to make the land abundantly mellow as deep as the roots extend, using such implements as will not break the roots, and then to fork out the plant, root and blade, or pull them up by hand. *Never break a twitch grass from the stem.* Let the whole plant come out together, so that no fragments may be left to grow and again fill the soil. Go over the land a few times, and wherever a blade shows itself, *extract the whole plant*, and you conquer, or at least let me say I conquer when I will, and in no other way so cheaply. The time is best when the soil is dry, for then it is most light and mellow; and when the sun shines hot, so that the spread out plants quickly wither and lose their life. Then they need not be raked up and taken off at once, for their life is gone from them, and neither the damp day nor a summer shower succeeding, will set them to growing. But cheapness there is none where twitch grass is. It is an expensive enemy to battle with, at best. I will note, however, a very cheap way of getting the grass distributed over the farm, and it is a way other kinds of grass, not desirable, can be increased. To save the purchase of seed to put upon bare spots, where the grass seems winter killed, sweep the barn floor until enough seed is collected for the purpose. I have not done this; but from the distribution of the grass upon my farm at the time I came to it, I can but believe this economy had been practised. Now I think of it, there are many things I have not done, but they are not always such happy escapes from blunders.—*Cor. Scientific Farmer.*

DRILL AND HAND SOWING.—Farmers will be interested to know the results of an experiment made during the past season as to the relative merits of broadcast and grain drill sowing, which was made on the State Experimental Farm in Pennsylvania, and from which we learn that 2½ bushels, hand sowed, produced 116½ bushels; while the same quantity of seed on the same amount of land sown with a grain drill produced 127 bushels. In the face of such facts, it is astonishing that so many farmers fail to become purchasers of the valuable adjunct to husbandry—a grain drill.

Cultivation of Buckwheat.

At a recent meeting of the New York Farmers' Club an address was read on the Culture of Buckwheat, from which we extract as follows. –

Buckwheat is a plant known to almost every part of the world. It is eaten in Switzerland and the southern parts of France, and in Flanders its cultivation is a considerable branch of industry, while in China, Japan, and Russia, it furnishes a large percentage of the food of the inhabitants. It was brought into Europe from the northern part of Asia, and was cultivated in England as early as 1597. A large proportion of the buckwheat raised in the United States is cultivated in Ohio, Pennsylvania, and New York. Buckwheat thrives well on almost any dry soil, even of the poorest description. Indeed, the lighter soils are best adapted to it, as on rich earth it is liable to run too much to straw. There are several reasons besides this why buckwheat is extensively cultivated, namely: It calls for but little labour, and the period in completing its growth is very short. If sown in midsummer, it usually has full time for attaining maturity. Still, the success of buckwheat is very precarious. In the first place, it is susceptible to the slightest frost, and is remarkably affected in the several stages of its growth by the weather to which it is exposed. Immediately after sowing it requires dry weather, in fact, will spring up best in time of great drought; but after putting forth its third leaf, it needs rain in order that its leaves may be developed before the flower comes, which soon follows. During the flowering time it requires alternate rain and sunshine to facilitate its growth and enable the flowers to set. Buckwheat is incapable of withstanding violent eastern winds, which causes it to wither before its flowers are set. After flowering, the plant again requires dry weather to bring all the seeds to maturity at the same time, and thus insure an early harvest. I also believe that the success of the plant depends not only o the general state of the weather throughout its growth, but the particular time which may have been chosen for sowing, a week earlier or a week later often making a vast difference. Hence many farmers, to insure a perfect crop, sow different portions at different times. The seed should, according to my experience, be simply covered up with a harrow. The ripening of the grain is very unequal, and for that reason it ought to be cut at the time the greatest quantity is ripe, and the rest will ripen while the crop is lying on the ground after cutting. The small amount of fodder produced is, perhaps, the principal objection to the extension of the culture of buckwheat, for the straw being of little value, if the grain fails, the labour of cultivation seems lost. But notwithstanding all these drawbacks, its cultivation, I think, should be more general than it is, especially where land is abundant and not of a very high order of fertility. A purpose to which buckwheat has been applied from time immemorial, and for which it seems well adapted from its quick growth, is ploughing it down when green, as a manure for the land, but I think that where a good system of agriculture is established, and a proper combination of the practice of tillage and feeding live stock exists, a green crop, when raised, will be more advantageously applied to the feeding of animals, and the manure, which the consumption of it produces, afterward applied to the ground. In addition to the flour which gives us all our buckwheat cakes during the Winter breakfasts, this grain can also be applied to the same purposes for which the grain of the cereal grasses can be used. The seeds of the buckwheat are fed with advantage to horses, to poultry, and to hogs. In conclusion, I would add that I think the roller injurious to its culture, and find that in Ohio we can raise a finer quality of buckwheat to the acre than elsewhere throughout the country; but whether this is the result of some contingent circumstances, or of some permanent adaptation of the soil and climate to the grain, I am not able to decide.

Superphosphate and Top-Dressing.

I top-dressed about half of a clover field one year ago last winter, and it protected the clover on that portion of the field, while on the other part it was nearly all killed by the extreme cold and dry weather. The result was, that portion yielded four times as much pasture as the remainder of the field. My wheat did not yield as much, where it had been top-dressed last season, as formerly, but it yielded three times as much as where not top-dressed, and the yield of clover will be more than double this season. I had a field of corn that yielded over 150 bushels of ears per acre, last year, without any fertilizer, the effect of previous surface manuring. My reasons for using phosphate are the following: I do not have manure enough, and it requires a great deal of labor to pile it, so as to have it sufficiently rotted for wheat. Then it must be applied in a busy time of year; and if the field is far from the barn it costs more to haul and apply it, than the entire cost of the phosphates. By using phosphate for wheat, it leaves the manure for grass lands, and it can be applied to them during the foddering season, directly from the stables. This not only saves handling, but is done when teams are at leasure, and other work is not pressing, and there is an immediate benefit derived from it. As to the effect of phosphate: I think it is greater than a dressing of manure, on any soil Good judges estimate the yield where it was used, at fifteen bushels more per acre than where it was not used. I have not heard of a single failure where it has been used in this country. All claim that it will double, or more than double the yield of wheat. If Mr. Ewer will come and see my wheat, I will show him a field where the surface is flat, the soil a clay, and the wheat almost a failure on the portion receiving no

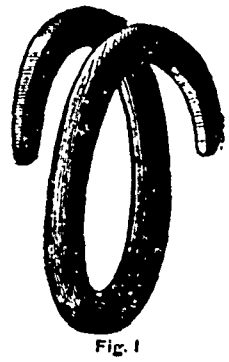


Fig. 1

phosphate, while where it was applied it promises a heavy crop. On other portions of the field where it is more rolling and a gravelly, loamy soil, there is but little difference. The facts are, where the phosphate was used the wheat presents a splendid, uniform appearance, and where it was not, and no fertilizer used, the greater portion will be almost a failure.—*Cor. Am. Rural Home.*

Open Links.

A correspondent of the *American Agriculturist* publishes two samples of open links suitable for emergencies, which we here reproduce.

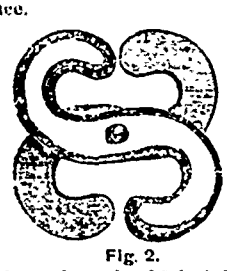


Fig. 2.

One of these (fig. 1) is made of ⅜-inch iron rod, and when used to connect a broken chain, is simply closed by a blow from a hammer or a stone. There being no rivet, the link is not weakened in any way. Figures 2 and 3 show another link, made of malleable cast iron, in two parts, which are fastened together by a rivet in the centre. This link is seen open at figure 2, and closed at figure 3. A few of these links may be carried in the pocket, and are ready for

Fig. 3.

instant use in case of an emergency. The last mentioned links are kept for sale at the hardware stores, and are known in the trade as Kirk's links; the first named may be made in a very short time by a blacksmith, or any farmer who has a workshop and a portable forge.

Points in Shocking Wheat.

There is altogether too much carelessness practised in shocking or stocking of wheat, says the *Rural World*, and it results in great loss to the farmer, especially when the harvest season is an unusually wet one. The object in shocking wheat is to keep it dry previous to the time it is put in the barn or stack or threshed. To pile up the bundles, as is often done by inexperienced men or boys, is a ruinous course to pursue.

If grain is neatly and properly shocked and capped, that beneath the caps will not be injured, even though there may be a large amount of rain. But the bundles must be even and not too large, and they should be tightly bound, for they will not only keep out the rain better, but the small sheaves will dry out more readily than the large ones. Most farmers, of course, know how to shock wheat properly, but the trouble is, this important part of the work is too often entrusted to boys, who have neither the ability nor the will to do it properly. The best way to set up a shock of twelve sheaves is this: Set up six bundles, three on each side, thursting the butts (once only) of the bundles firmly on the ground, then lean the heads toward each other; then place two other bundles on each side of those already set, and draw the heads of all ten sheaves compactly together; then take two more of the best bound sheaves for caps, and, holding one of the sheaves before you—heads of grain up—break it down over the band a handful at a time; then open the butts without altering the position of the sheaf at all, spread it considerably and place it on the head of the shock; now break the other cap and place it on top of the first one, but from the opposite side of the shock, laying one over, but not across the other. If, when the shock is completed, a dozen or so of the heads of the top cap are tucked under the band of the lower cap, neither will be very easily blown off. Wheat carefully shocked in this way will stand a great deal of exposure without being injured.

Experience has demonstrated the fact that early cut wheat will stand more exposure to wet weather than that cut later—for germination cannot commence until the grain is mature, and wet weather destroys the process of maturation, so that in many instances early-cut wheat, well shocked, has passed through an extended wet spell before it matured, and come out wholly unmjured.

Whether the shocks should be opened out to dry during a wet harvest depends very much on the condition of the atmosphere. When damp, hot, foggy weather occurs, such as promotes mildew in badly-ventilated rooms, then open the shocks and air the bundles whenever the weather will permit. If, on the contrary, the weather is cool, the preceding plan is not always advisable. If the harvest season is a very rainy and sultry one, the cap-sheaves should be stacked by themselves, as much of the grain in them will be sprouted. The handling and grading of grain is now reduced to a system, and the farmer will lose twice as much as he gains by allowing his damaged grain to be mixed in with that which is not.

The Compost Heap.

No amount of experiments, talk, and large results will draw farmers in a body away from keeping live stock, and the manure pile, and turn them wholly to "chemical farming." The compost heap will still be an adjunct of the prosperous farmer's barn-yard; nor would we have it otherwise. There is a great deal of unnecessary work expended upon this plant food factory, however, in repeated shovelings to prevent overheating. Thorough mixing and proper pulverization are of course essential; beyond this, work spent in shoveling is thrown away. Heating is the oxidation by the oxygen of the air of various substances in the compost, and is necessary, to a certain extent, for the decomposition of the coarse materials. Overheating is usually checked by frequent stirring. But this only checks it for a time, and afterwards, by the increased access of atmospheric oxygen, the heating (oxidation) is accelerated. A better way is to pack the surface down solidly, by simply treading upon the heap with the feet (after pulverization) or, still better, to spread a little earth over the pile, taking care to compact it somewhat. Either method tends to exclude air, and thus prevents too rapid oxidation. By adopting this practice so far as advisable, a large proportion of the expense in making compost may be avoided.—*Scientific Farmer.*

The Quality of Manure.

The value of animal excrement as manure depends not only upon the animal, but largely upon the kind of food it receives. Experience has clearly demonstrated that if the food received is rich, the manure is also rich. There are, however, other modifying circumstances which go to determine the quality of manure, such as the age of an animal, its condition as to flesh, etc. A growing animal cannot furnish as valuable manure as one that is fattening, since the growing animal requires nitrogen to make blood and muscular fibre, and phosphoric acid for bones, while a fattening animal requires only enough of these substances to supply the natural waste. Again, the manure of an animal that is giving milk is not as valuable as that of one that has no drafts made upon it. The excrement of animals is valuable in proportion to the amount of

ammonia, phosphoric acid and potash it contains, ; hence it is impossible to arrive at a strictly correct estimate of the value of a given weight of animal manure.

In a work on "American Manures," tables are given which afford a very instructive exhibit of the amount of water and other constituents contained in 1,000 pounds of manure in its natural, undried state. The tables give the following results for the different animals:

	Water, Lb.	Phos. Acid, Lb.	Potash, Lb.	Am. Lb.
Pig	840	8.0	5.0	8.5
Horse	743	12.2	28.0	6.5
Cow	864	5 2	10 7	4 2
Chicken	850	15.2	6.5	20.1
Sheep	670	22.7	7 0	8.5
Human	750	3.3	1.0	18.2

The same authority puts the value of these manures as follows for each 1,000 pounds:

Pig manure	$3 10
Horse manure	4 57
Cow manure	2 53
Chicken manure	8 00
Sheep manure	3 00
Human manure	5 00

The amount produced annually by a single animal is estimated to be:

Pig 200 lbs., equals	$0 62
Horse 2,000 lbs., equals	9 94
Cow 2,000 lbs., equals	5 15
Chicken 5 lbs., equals	04
Sheep 50 lbs., equals	40
Human 100 lbs., equals	50

Dr. Voelcher calculates the value of 1,000 pounds of well-rotted and dried stable manure to be $11.35, but that is a kind of manure which farmers seldom see.

The animals mentioned above will make in a year about the following amounts of liquid manure:

Pig, 1,000 lbs., value	$1 00
Horse, 2,000 lbs., value	9 76
Cow, 2,000 lbs., value	2 92
Sheep, 500 lbs., value	2 35
Human, 750 lbs., value	3 16

It is estimated that a pound of ammonia is required for the production of every bushel of corn; that every pound of urine of a horse or man will furnish sufficient ammonia for a pound of wheat.

List of the Indigenous Forest Trees and Shrubs of Ontario.

A perfect list of the flora of Ontario is perhaps not yet possible, as there are sections, such as the Muskoka, Lake Superior and Nepigon sections, which as yet have not been fully explored, and also because the boundaries of Ontario to the North and North-west are not yet defined The following list of "Indigenous trees and shrubs," has been compiled from a number of published and unpublished local lists; from contributions by many amateur botanists, and from some personal research.

It is hoped the publication of this list will elicit such information and criticism as will enable us to make it more full and correct.

The value of a list of the plants or animals of a country depends on its fullness and accuracy. When full and accurate, besides being of great practical value, it has a scientific value in establishing facts as to the progress and direction of the geographical distribution of species, and, perhaps, throwing some light on the question of their origin. All those species, the date of the introduction of which is known to be contemporary with, or later than, the date of the earliest settlements will be classed as "introduced," all others as "indigenous."

As in almost every *classification*, a difficulty occurs in defining limits, so, in a list like this, it is sometimes difficult to say what is shrubby, or what is herbaceous—some species being shrubby at the root and herbaceous above, some shrubby in a southern locality, scarcely so further north.

The list will first appear classified according to the "natural system;" then a short notice of each species will be given, which will include the common names, localities where found, uses in the arts and in medicine.

We would define the term "species" as *an element of the physical world*, having as distinctive and true elementary characters, as a chemical element. The true specific idea is not in the race, nor in the individual, but in the power possessed by the individual to produce a being similar to itself.

Ranunculaceae.

Clematis verticillaris, D. C., Clematis Virginiana, L.

Magnoliaceae.

Magnolia acuminata, L., Liriodendron tulipifera, L,

Anonaceae.

Asimina triloba, Dunal.

Menispermaceae.

Menispermum Canadense, L.

Cistaceæ.

Hudsonia tomentosa, Nutt.,

Hypericaceæ.

Hypericum Kalmianum, L.,

Tiliaceae

Tilia Americana, L.

Rutaceae.

Xanthoxylum Americanum, Mill.

Anacardiaceae.

Rhus typhina, L., Rhus glabra L,
Rhus toxicodendron, L., Rhus aromat ca, Ait.

Vitaceae.

Vitis cordifolia, Michx, Vitis riparia, Michx,
Ampelopsis quinquefolia, Michx. Vitis Labrusca, L,

Rhamnaceae.

Rhamnus alnifolius, L'Her, Ceanothus Americanus, L,
Ceanothus ovalis, Bigel.

Celastraceae.

Celastrus scandens, L., Euonymus atropurpureus, Jacq,
Euonymus Americanus, L

Sapindaceae

Staphylea trifolia, L., Acer dasycarpum, Ehr.,
Acer Pennsylvanicum, L, Acer rubrum, L,
Acer spicatum, Lam., Negundo aceroides, Mœnch.
Acer saccharinum, Wang.,

Leguminosae.

Amorpha fruticosa, L., Cercis Canadensis, L,
Robinia Pseudacacia, L., Gleditschia triacanthos, L
Robinia viscosa, Vent.,

Rosaceae.

Prunus Americana, Marsh, Prunus serotina, Ehr.,
Prunus pumila, L, Spirea opulifolia, L,
Prunus Pennsylvanica, L, Spirea salicifolia, L.
Prunus Virginiana, L, Spirea tomentosa, L,
Rubus odoratus, L., Dryas integrifolia, Vahl.
Rubus Nutkanus, Mo, Potentilla fructicosa, L.,
Rubus trivialis Rich, Rosa rubignosa, L.,
Rubus strigosus, Michx., Rosa Micrantha, Sm.,
Rubus n[illegible]us, Peck, Cratægus coccinea, L,
Rubus occidentalis, L., Cratægus tomentosa, L.,
Rubus villosus, Ait., Cratægus crus galli, L.,
Rubus Canadensis, L, Pyrus coronaria, L,
Rosa Carolina, L., Pyrus arbutifolia, L.,
Rosa [illegible], Fur, Pyrus Americana, D C,
Rosa blanda, Ait., Amalanchier Canadensis, T. & G.

Saxifragaceae.

Ribes Cynosbati, L., Ribes floridum, L.,
Ribes hirtellum, Michx., Ribes rubrum, L.,
Ribes lacustre, Poir., Ribes oxyacanthoides, L
Ribes prostratum L'Her,

Hamamelaceae

Hamamelis Virginica, L.,

Araliaceae.

Aralia nispida Michx

Cornaceae.

Cornus florida L, Cornus stolonifera, L,
Cornus circinata, L'Her, Cornus paniculata, L Her,
Cornus sericea, L, Cornus alternifolia, L.

Caprifoliaceae

Symphoricarpos racemosus, Mx, Viburnum lentago L,
Lonicera parviflora, Lam., Viburnum prunifolium, L,
Lonicera hirsuta, Eaton, Viburnum nudum, L,
Lonicera flava, Sims, Viburnum pubescens, Pursh,
Lonicera ciliata, Muhl, Viburnum dentatum, L,
Lonicera [illegible], Muhl, Viburnum acerifolium, L,
Diervilla trifida, Moench, Viburnum pauciflorum, Pylaie,
Sambucus Canadensis, L., Viburnum opulus, L,
Sambucus pubens, Michx, Viburnum lantanoides, Michx

Rubiacex

Cephalanthus occidentalis, L.

Ericaceae

Gaylussacia resinosa, T. & G., Vaccinium corymbosum, L.
Gaylussacia brachycera, Gray, Arctostaphylus uva ursi, Ep.,
Vaccinium oxycoccus, L., Cassandra calyculata, Don.,
Vaccinium macrocarpon, Ait, Andromeda polifolia, L,
Vaccinium vitis idæa, L., Kalmia augustifolia, L.,
Vaccinium ovatipsum, Michx, Kalmia glauca, Ait.,
Vaccinium uliginosum, L., Rhodora Canadensis, L.,
Vaccinium Pennsylvanicum, L., Ledum latifolium, Ait.,
Vaccinium Canadense, Kalm, Ledum palustre, L.,
Vaccinium vacillans, Sola,

Aquifoliaceae.

Ilex verticillata, Gray, Nemopanthes Canadensis, D. C.
Ilex laevigata, Gray,

Oleaceae.

Fraxinus Americana, L., Fraxinus sambucifolia, Lam
Fraxinus pubescens, Lam,

Lauraceae.

Sassafras officinale, Nees, Lindera Benzoin, Mcls.

Thymeleaceae.

Dirca palustris, L.

Elegnanaceae.

Shepherdia Canadensis, Nutt

Urticaceae.

Ulmus fulva, Michx, Ulmus alata, Michx.,
Ulmus racemosa, Thom, Celtis occidentalis, L
Ulmus Americana, L.

Platanaceae.

Platanus occidentalis L

Juglandaceae.

Juglans cinerea, L., Carya tomentosa, Nutt,
Juglans nigra, L, Carya glabra, Torr,
Carya alba, Nutt, Carya amara, Nutt.

Cupuliferae.

Quercus alba, L., Castanea vesca, L.,
Quercus macrocarpa, Michx, Fagus ferruginea, Ait
Quercus bicolor, Willd, Corylus Americana, Walt,
Quercus Prinus, L. Corylus rostrata, Ait.,
Quercus Ilicifolia, Wang. Carpinus Americana, Michx,
Quercus coccinea, Wang, Ostrya Virginica, Willd.
Quercus rubra, L.,

Myricaceae.

Myrica Gale, L., Comptonia asplenifolia, Ait.
Myrica cerifera, L.,

Betulaceae.

Betula lenta, L., Betula alba, Spach.,
Betula papyracea, Ait., Alnus incana, Willd,
Betula excelsa, Ait., Alnus serrulata, Ait.
Betula pumila, L., Alnus viridis, D.C.

Salicaceae.

Salix candida, Willd, Salix lucida, Muhl,
Salix tristis, Ait., Salix nigra, Mars,
Salix humulis, Mars, Salix longifolia, Muhl,
Salix discolor, Muhl, Populus tremuloides, Michx.,
Salix livida, Muhl, Populus grandidentata, Michx,
Salix petiolaris, Sm., Populus monilifera, Ait,
Salix cordata, Muhl. Populus balsamifera, L.

Coniferae.

Pinus strobus, L, Abies balsamea, Mars,
Pinus resinosa, Ait, Larix Americana, Michx,
Pinus mitis Michx. Thuja occidentalis, L,
Pinus Banksiana, Lam, Juniperus communis, L.,
Abies nigra, Poir. Juulperus Virginiana, L.,
Abies alba, Michx, Juniperus Sabina, L,
Abies Canadensis, Michx, Taxus baccata, L.

Smilaceae.

Smilax rotundifolia, L., Smilax hispida, Muhl

Toronto. W. BRODIE.

Animal Urine.

In spite of all that has been urged in regard to the value of liquid manure, comparatively few farmers make any special effort to prevent its waste. "Line upon line and precept upon precept," must be the rule with the agricultural press, until the importance of the now neglected sources of wealth are properly understood and appreciated. From experiments carefully made by Boussingault, it appears that a cow annually voids 13,000 pounds of urine, equal to 900 pounds of solid matter, and containing 400 pounds of urea, and 230 pounds of ammonia. This is nearly two and a half times the dung produced by the same animal. The fertilizing power of the urine is far greater than that of the dung. According to Prof. Johnson's experiments, it requires 125 parts of the latter to produce the same results that 91 parts of the former are capable of producing

Again the urine of a single cow for one year contains 230 pounds of ammonia, or about 190 pounds of pure nitrogen, the most expensive plant food we have, because so volatile, so hard to obtain in a permanent form. Sulphate of ammonia is the commercial form in which this substance is most cheaply obtained. It contains about 20 per cent. of nitrogen. Hence, in order to obtain 190 pounds of nitrogen, 950 pounds of sulphate must be taken; call it 1,000 pounds even measure, for it must be a very good article that yields 20 per cent. Now sulphate of ammonia is worth, at present, five to six cents a pound. At five cents the cost would be *fifty dollars*. Now, this is not *all* lost, even by the most careless farmers, but I am persuaded that, on the average, three-fourths of it is. And this is not all. Besides ammonia, this urine contains about 90 pounds of potash, and about as much phosphoric acid—the three essential elements of a perfect fertilizer. Then there are 50 pounds of sulphuric acid, 70 pounds of soda, besides smaller quantities of lime, magnesia, etc.

I have thus given, briefly, what numerous and careful investigations have demonstrated. I think the figures are correct, or within bounds. And remember this is but the produce of *one* animal. Multiply it by the whole number kept on the farm, and the value annually wasted will assume something like its true proportions. I am persuaded that in this one particular, the farmers of this country lose enough fertilizing material to keep the farms up in a good state of culture, if it was properly saved. In future articles I may pursue the subject further, if it is desired. —*Cor. Ohio Farmer.*

CURIOUS GROWTH OF A TREE.—Near No. 53 Blardino street, in Utica city, stands a tree which has excited the wonder of all the dwellers in that vicinity. It is a maple, standing perhaps, fifteen feet from other maples on either side. For three years it has been completely girdled for a space of about three feet from the ground. During that time it has lived and flourished, producing foliage which has attracted the attention of all observers for its peculiar brilliancy and deep green tint. The bark of the girdled portion was removed by natural decay, and above that portion it is perfectly sound. A natural aperture extends from the girdle upward about six feet, laying bare the somewhat decayed pith of the tree. And here is visible that which arouses the wonder and the theories of observers. A vine of some variety, it resembles an ivy vine, seems to have grown up the hollow heart of the tree It appears plainly visible in the crevice, and thus the strange life and abnormal greenness are explained. It is thought that the maple and the vine in its interior have combined, that the vine bears the sap past the area denuded of its bark, and that the extreme greenness of the verdure is due to the mingling of the life of the ivy. The vine or shoot does not seem to have grown above the aperture, and there is a possibility that it is a maple shoot. Whatever the truth may be, the tree has lived under a combination of circumstances which would have killed an ordinary tree, and it provides an opportunity for experiments by the student of sap flow in trees.—*Utica Her.*

Horticulture.

Growing Roots, Kohl Rabi, and Cabbage for the Farm.--No. 1.

We shall never succeed in raising thoroughly good crops in Canada until we can procure more manure, and to do this we must be able to produce root crops at the lowest possible expense, and to that end with the absolute minimum of labor. It is the cost of men's labor that prevents the raising of more roots, and the fact that our seasons are such that the roots, when raised, cannot be consumed on the land, because by the present mode of cultivation, they come to perfection too late in the season for that purpose. If, therefore, we would have the full benefit of the root crop, we must gain on our usual seasons by at least two months, and, for economy's sake, we must reduce the hand labor far below what it now is.

This can be done in the following manner: We must raise the plants from the seed under glass, so as to be independent of the season, and the fly.—We must transplant and set out and manage the plants so raised in such a manner as not to require singling and hand hoeing; and so that they can be cultivated both ways across and athwart by the horse-hoe—the cultivation and horse-hoeing being so small a matter as to be within the reach of every one.

The Americans reckon that a boy and a horse will cultivate and keep the weeds under of 20 to 30 acres of corn; the same power can be therefore most certainly relied on to horse-hoe and keep under the weeds on one quarter that average of roots or cabbages, and that proportion is all we need look to at present.

To accomplish these ends we must pursue the following course: The ground for the future roots must be ploughed and well-manured the previous fall, as it is at present wherever roots are successfully raised; it must be prepared on the flat, as ridges in this system are not required. There may be others who prefer adapting the plan to ridges; if so, it can be done.

In the spring, as soon as the weeds start, the land must be well harrowed with the lightest possible harrow. A second harrowing should take place just before the plants are set out. This will kill all the seed weeds, which are then on the surface; of course all root weeds must have been otherwise destroyed.

We must now show the preparation of the ground for the seed: A seed bed must be constructed of at least six inches deep, of the loosest and purest sand, mixed with from one third to one half of old rotted manure, manure which has been used for a hot bed, or which has been specially heated so as to kill all, or most of the weed seed, is the most proper for this purpose. This seed bed must be covered by a glass frame, constructed in the following manner: The sashes are to be six feet by three, and are hung on pivots a little out of the centre of the ends of the frame, so as to ensure their tipping, and remaining tipped, when required to be opened. The sashes are glazed with strong glass, the glass put edge to edge, not lapped or puttied, but held in their places by small pieces of tin or grooving the wood; and they do not touch each other by about one fourth of an inch. This is to insure ventilation, and to admit the rain. The glasses are only to raise the temperature, and bring on the growth of the plants, and to keep out the worst of the frost, when a late frost occurs. But the plants must always be kept so well aired that they do not grow leggy, and as soon and as often as the weather admits of it, the sashes must be tipped, so that full air and sun is given, and the plants made thoroughly hardy before the time comes for setting them out. A frame of this kind, 6 x 12 feet, exposing a surface of 72 superficial feet will be sufficient for two acres of roots.

About the 10th of May the plants are forward enough to put out. They must be carefully taken up so as to keep all the fibres and roots without injury; and it is for this purpose that the seed bed is to be made of loose sand and well rotted manure. Such a soil will grow the plants with great luxuriance, and will enable them to be withdrawn for transplantation, without injury. Indeed, if the work is well done, and the fibres and roots are uninjured, the plants, when planted out, will hardly wilt, and if you have a good wet time, will not go down at all, but will start and grow in their new station "right away".

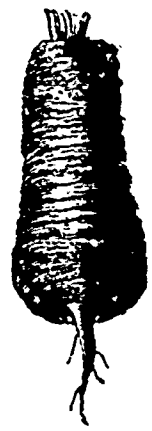
This frame and seed bed may be made and used about home for convenience, or it may be used in the field where the roots are to be grown. It will be moveable, at any rate, and easily erected and taken down. Being thoroughly ventilated, it will want but very little attendance, until you harden off the plants, when the glasses must be regularly opened each morning.

If the sand and manure are not well selected, the frame may require a weeding, but it ought not, and if the seeds come up too thick, it may require a thinning, but it will not require three days' work during the whole season, with the exception of opening and closing mornings and evenings, and at odd times, and this work, from the construction of the frame, will only require a few minutes' time, and there will be no heavy lifting or pushing, or chance of breaking the glass.

SUBSCRIBER.

Scarlet China Radish.

The root of this esculent is somewhat fusiform, retaining its diameter for two thirds of its length, sharply conical at



the base, and, when well grown, measuring seven or eight inches in length, by nearly three inches in its fullest diameter. The skin is white, slightly wrinkled, sometimes tinged with purple where exposed to the sun; flesh white, solid and pungent, though milder than that of the Black Spanish. The winter varieties should be sown in August in drills eight inches apart, and one inch deep, and should be pulled before severe frost sets in. As the roots are more succulent and tender when grown quickly, a rich, moist, sandy soil should be selected, and frequently watered in dry weather.—*Rennie's Catalogue.*

Centaurea.

Centaurea Cyanus, which we illustrate from the catalo-

gue of Mr. Rennie, is a popular border hardy annual, commonly known under the name of Blue-Bottle. In many parts of Europe it is a very ordinary weed in cornfields &c., and on gravelly soils, bearing beautiful, blue bottle-shaped flowers; but when properly cultivated, it spurts out into numbers of white, purple, parti-colored blossoms, and is a very handsome natural ornament.

THE distance apart for trees vary with apples from 20 to 40 feet, the greater distance being given on strong soils to the spreading varieties. Standard pears 20 to 30 feet; dwarfs 8 to 12 feet. Peaches, plums and cherries about 15 feet.

The Way to Transplant Plants.

Not one person in five hundred knows how to put out living plants as they should be transplanted. In the first place the plants should be taken up correctly. Let the soil where they are growing be thoroughly saturated with water several hours before the plants are to be taken up. Then, instead of laying hold of them roughly and pulling up a large handful, thus leaving most of the roots in the ground, thrust a trowel or spade beneath them and loosen up a dozen or more. By this means each plant can be taken up with a large portion of the fibrous roots still adhering to the main root, with a little ball of fine soil. We always take an old milkpan, into which is put about two quarts of cows' droppings and the same quantity of fine muck, which are wet with warm water and stirred until the mass is about of the consistence of thick gruel. Into this liquid the plants are placed with care until the pan is filled with plants, all standing erect. Then one person takes the pan and hands the plants one by one to an assistant, who puts them carefully in the soil. When plants are to be transported by mail or express, all the large leaves should be clipped off, leaving only the central bud. If the large leaves are not cut off, they will soon exhaust the sap from the roots and stems, so that many of the plants will wither and die. When the roots have no ball of earth adhering to them they will not take a vital hold of the soil until after the lapse of from one to four or more days. But as soon as the small rootlets begin to spread through the soil, leaves will be reproduced as fast as they can be sustained. Hence there is nothing lost by cutting off all the large leaves soon after the plants are taken up. Plants of any sort will be more likely to live if put out toward evening than if transplanted during the former part of a hot and dry day. If the weather is cloudy, one time will be no more favorable than another for transplanting,, with a view of having the plants live and grow quickly.—*N. Y. Herald.*

Lily Culture.

Much non-success in the cultivation of lilies arises from "working in" too much fresh manure, which has come in contact with the bulbs and caused them to decay. If the following treatment is given them, but little fear of failure need be apprehended; In the fall, after the stems are ripened off or killed down with frost, lift all the bulbs, and if the soil is of a loamy nature, procure some fresh muck (the most preferable being that in which the native lily luxuriates) and shake all roots of weeds, &c., out of it; then put a good covering of it on the bed, also a good manuring of well decayed manure, and trench the bed about 18 inches deep, keeping the manure well to the bottom of the trench, so that most of it shall be below the base of the bulbs, incorporating at the same time the peat of muck well with the soil. After the trenching is done, level the bed on the surface, and plant the bulbs in rows about one foot apart for small bulbs, larger ones farther, and about the same distance in the rows, putting them into the ground from six to eight inches deep. Before severe frosts set in, cover with a good protection of rough horse manure, or any such material which will help to keep them from getting too much frost. In the spring, before the bulbs start, remove the covering and they will come up strong and vigorous. When planting the bulbs, surround each one with a good handful of river sand.—*C. Gentleman.*

Black Knot.

The knot, says the *Maine Farmer*, is much modified in character, early in the season, by insects stinging the excrescences, as well as the plums; so that there exudes from both a gummy substance in great abundance. It is probably owing to the fact that the curculio stings the knots that so many persons have been led to the opinion that the knots themselves are of insect origin. Upon this point Prof. Farlow relates this from his observation: "I was greatly astonished last summer while studying the development of the disease on a certain plum tree, which, until the first of July, had progressed just as in the neighboring choke cherries, to find after an absence from town of about ten days that the whole aspect of the plum knots had been changed by the attacks of the curculio, so that they were hardly recognizable, owing to the gummy masses upon them—while the knot on the cherries remained unchanged."

The remedy for this disease is plain; as soon as the knot makes its appearance, cut off the branch just below the swelling of the stem, which is just below the knot. These branches should be burned to prevent the spores from spreading the disease. The choke cherry, bird cherry, and wild plum which carry this contagious disease, should be banished from all neighborhoods where there are plum trees. While it may be a hard matter to keep it entirely from our plum trees, it need not be allowed to spread to parts of the country now free from it. The disease is yet unknown in Europe.

Training Fuchsias.

A fuchsia started from a cutting and grown near the glass, with plenty of room in a house where there is plenty of air given, will make a more symmetrical plant by allowing the centre shoot to grow uncut; of course there are some varieties which naturaliy incline to run up in a single shoot and require to be pinched, but such varieties are seldom worth cultivating Some people like plants grown in bush form, and to obtain this, pinching has to be regularly done.

The following answers to the questions asked by Aunt Katie may assist her somewhat with her plants·

1. Set the fuchsias, if through flowering, in some cool place where they can be kept dry and rested for a few months; *Crassula perfoliata* should be set out of doors in some position where it can receive plenty of sun, which will induce it to flower more abundantly during the next winter.

2. Plant the calla into the ground in some well-enriched portion of the garden.

3. English ivy should be kept as cool as possible during summer, therefore place it in some shady, cool position. To induce "back breaks" on your ivy, place a few stakes around the edge of the pot and train the shoot in a horizontal position on them, and the eyes at the axils of the leaves will soon start into growth.

4. Flowering geraniums cannot ha e to deep a soil to grow in during summer. This prevents the dry weather taking too great effect on them. A sunny position suits them best. If of a straggling habit, pinch back when set out.—*C. Gentleman.*

New Varieties of Strawberries

The day is fast passing away when people are satisfied with the old-fashioned small and inferior varieties of strawberries; particularly when reports reach them of how others are feasting on giant berries of the finest quality and which can be raised with about the same attention and care that their less favored and now despised comrades demand. They look with longing eyes upon some of the new kinds, such as the well known "Monarch of the West" or "Champions," varieties that bear delicious berries from five to seven inches in circumference, requiring only six or eight of them to make a presentable saucerful, while their own degenerated representatives of the strawberry race require almost as many dozens.

Having carefully watched the growth of some of these larger berries, and having experimented with them in various ways, I can give a short description of a few of the most promising of such as may prove of value to those who may desire to keep posted with new fruits. Among the newest may be mentioned *Kerr's Prolific*, a desirable new kind that is now attracting a good degree of attention. It succeeds on nearly all soils, and is remarkable for its productiveness, and the unusual size of its foliage; many of the fruit stalks measuring nearly 18 inches in length. The berries are large, of a bright, glossy, scarlet color; sufficiently firm for shipping, and of a sweet and pleasant flavor. They have the valuable trait of keeping a long time on the plants after ripening, without losing their flavor or becoming soft.

Star of the West.—This is a variety that seems destined to occupy as high a position in the estimation of fruit growers as any that received their attention. Its merits are, its bright red, shining color, large size, and fine quality of the fruit. The plants have a vigorous, dark green foliage, with stout fruit stems, keeping the berries protected from the sun and dust. It is very productive, succeeding on either sandy or heavier soils. The fruit is sufficiently firm to keep well over night after being picked, or for sending off to distant markets.

Matilda, though not belonging to the class of "very large" berries, is, nevertheless, of such a size, and possessed of so many good qualities, that it has become quite a favorite among the fruit growers along the Hudson River. It has a bright attractive color, pleasant flavor, and is very generally esteemed for either market or family use. It is quite thrifty and productive. I have seen it bearing abundantly on a hard clay that was baked so firmly by the sun as to require the use of a pick to penetrate the soil.

Cumberland Triumph can, without doubt, be called a triumph in the art of raising new strawberries. The plants are of vigorous growth and very prolific, and will prove a welcome addition to the strawberry family. The berries are of a fine shape, large, of a light color, and fine flavor, and will meet with general approval.

The Monarch of the West, Champion, Col. Cheney, and Boyden No. 30 strawberries are all of considerable merit, bearing fruit of immense size. Berries have been picked from them all, measuring 6 inches, and in some cases even 7 inches in circumference. They are all strong growers, frequently measuring a foot and a half across the top, and in some instances so productive that two quarts of fruit have been picked from a single plant. Other kinds on my trial list might be named, but these are the ones that are receiving the most attention at present.

To be successful in getting extra large berries, care should be taken to start aright. In making a strawberry plantation, nearly any soil, however, will answer, if it is either naturally or artificially drained in such a way that water will not stand upon the surface too long. Have the ground carefully ploughed or spaded and well enriched Then set the plants in rows 2 feet apart for garden culture, or 3 or 4 feet apart for field planting, setting the plants one foot distant in the rows. Keep the ground well cultivated during the season, and free from weeds, and you will be amply repaid by the admiring glances and hearty approbation of any of your friends whom you may invite to feast upon the delicious and tempting strawberry giants you will have to show for your care and attention —*N. E. Farmer.*

Onions.

Prof. W. J. Beal, of Michigan Agricultural College gives a report of an experimental plot which was planted with onions last year. A row ten feet long, of each sort, was planted on sandy, leachy soil, and all treated alike. They were harvested at the close of the growing season, with the following results.

	Weights.
	0 lbs 10 oz.
Nasby's gray mammoth, poor, unripe.. ...	11 " 10 "
White globe, mature	12 " 12 "
Early red globe, nice, mature	15 " 5 "
Giant rocca, uneven, immature ...	8 " 9 "
Improved large yellow cracker, mature	0 " 12 "
New Queen, early, amount to little.....	6 " 8 "
White flat Italian, very early	7 " 3 "
Early flat red	14 " 14 "
Southport late globe, not mature, large.....	12 " 14 "
Yellow Strasburg	3 " 11 "
Margajole, one-half scullions	15 " 14 "
Large round giant Madeira, immature, large...	8 " 8 "
White Portugal, pretty, white, and striped with pink	11 " 6 "
Yellow Danvers mature ...	
Red Wethersfield, not at all mature, good yield	
The quality has not been tested..... ...	

Prof. Beal says: "From our short experience I should recommend the Wethersfield and Early Red Globe for red onions. They are not considered quite as good quality as the yellow and white varieties, but they yield well and keep well, and are thought to be rather more hardy. For yellow onions I prefer Yellow Danvers, and Improved Large Yellow Cracker. The white sorts are the most delicate, and need careful handling. I like the White Globe and White Portugal.

Planting Evergreens.

Wm. Morton, of Maine, in writing of how, when and where to plant evergreens, says that in his experience any good soil is all that is required, if it admits of thorough drainage Never set evergreens where stagnant water will settle round their roots, as it is almost sure death to them. Some varieties, like the Arbor Vitæ and Larch, will live in a low, wet place, but a good dry soil is just as well, or better. In preparing the soil, spade at least a foot deep, and pulverize thoroughly. Never use fresh manure, but always that which is old and well rotted, and mix thoroughly with the soil. You throw money away to buy any but good plants, well rooted. Above all, be sure the roots have never been dried in the sun or wind, which is easily ascertained by starting the bark on the root; if fresh and good, the wood will be white, but if they have been dried, no matter if dripping wet when received, the wood will be red and discolored. Plants in that condition are worthless. Mr. Morton favors planting between April 1st and July 1st, and prefers to plant from May 15th to June 20. In more southern localities, fall planting would be better. When preparing plants to set, sort your stock so as to plant each size by itself. Puddle the roots well by dipping in a mixture of mud about the consistency of cream. Cover the roots with damp moss or earth, and the whole with some old canvas or other material, to prevent drying. In planting a hedge, select the kind and size of plants you wish: if Arbor Vitæ or Hemlock, 12 to 18 or 20 inches high is best; the smaller sizes will do equally as well, but will require a year or two more time. Have your ground thoroughly prepared and plant in this form, * * * * * * two feet apart in each row, and the rows one foot apart. A single row will give a good hedge if set one foot apart, but will take more time and never be so thick and compact at the base as a double row. On the vast prairies of the West nothing is more essential than a wind-break of suitable evergreens, and the Norway Spruce, Balsam Fir, Hemlock or Weeping Spruce, White Pine, White Spruce, Larch, and Arbor Vitæ are one and all suitable for the above purpose. Plant the same as for a hedge, only further apart, say six to eight feet in the row, and the rows four to six feet apart, for all but the Arbor Vitæ and Hemlock; plant those three feet in the row, and rows two to two and a half feet apart.—*Practical Farmer.*

SMALL TREES.—Dealers in trees assert that experienced men buy small, thrifty trees, while those who are just starting are anxious for the largest ones to be had. Those who are to set trees the coming season will do well to learn from experience of those who at considerable loss to themselves had demonstrated that small trees are the ones to buy.—*N. E. Homestead.*

NEW METHOD WITH ASPARAGUS.—A correspondent of the *Gardener's Monthly* tells of a bed, of some 12x20 feet, planted on good level soil; and when its growth became strong, year by year covered with two or three inches of good rich mould. Up through this shot the stalks and crept the roots. The method was followed up every season with the result of larger growth and product, till the bed became an oblong mound of some 2 or 3 feet in height, and a perfect wonder in the quality and quantity of asparagus furnished for the table. That yearly blanket of soil, it is thought, was the only culture or enrichment given. *The bed was never dug with a fork or spade.*

CURE FOR SICKLY POT PLANTS.—A French paper of of *Soissons*, on the authority of M. Willermoz, gives the following cure for sickly pot plants, which he states has been pursued for some years with unfailing success by M. Lucas, of Hohenheim. It is recommended in the case of plants which have become sickly through over-watering, planting too deeply, &c. Amongst the plants so treated were palms, roses, ficus elastica, and others. Instead of changing the soil it is well stirred and soaked with water, heated to a temperature of 133 deg. to 144 deg. (Fahr.) until it runs off freely from the bottom of the pots. After a few days the sickly plants recover their original look of health and vigor, and begin to grow again.—*The Garden.*

VEGETABLE AND HARDY FRUIT GARDEN.—Forced vegetables are often very easily procured, and invariably greatly appreciated. Foremost amongst these stand rhubarb. A spring or two ago we had an accumulation of old skeps upon the farm that were useless for further work, so we divested them of their worn-out bottoms and inserted them over a few crowns of rhubarb, placing three bricks under each skep to elevate them a little. They were then covered with litter from the stables and leaves, and we had a superabundance of most delicious rhubarb, which kept springing up till we were able to draw from the open ground. The old skeps were saved for a succeeding year, and the same plants were forced again with just the same happy result.—*Ag. Gazette.*

ROSES IN BEDS OR MASSES.—The Dingee & Conard Company, in their *Guide to Rose Culture*, give some excellent hints on planting roses, from which we select the following: To produce the finest effect, roses should undoubtedly be planted in beds or masses—no other flowers should be planted with them. When convenient, circular beds are perhaps the most desirable. These should be the highest in the middle, sloping gradually to the edge. A bed twelve feet in diameter will contain 150 roses. Deep colors are usually preferred for massing, and small beds of distinct colors are preferable to a large bed of promiscuous varieties. The plan of planting but one sort in a bed is probably the best of all. As it is important to have a regular and even growth, varieties of different styles of growth do not look well together.

THE WAY TO KEEP CUT FLOWERS.—Never cut flowers during intense sunshine, nor keep them exposed to the sun or wind. Neither collect them in large bundles, nor tie them tightly together, as it hastens their decay. Do not pull them, but cut them cleanly off the stems with a sharp knife, not with a pair of scissors. When taken indoors, place them in the shade, and reduce them to the required length of stalk with a sharp knife, by which means the tubes through which they draw up the water will be left open, and the water will ascend freely; whereas if the stems are bruised or lacerated, these pores will be closed up. Use pure water to set them in, or pure white sand in a state of saturation, sticking the ends of the stalks in it, but not in a crowded manner. If the stems are put in water alone, it ought to be changed daily, and a thin slice should be cut off the ends of the stalks at every change of water.—*Practical Farmer.*

NEW METHOD FOR CURCULIO.—At the January, 1876, session of the Iowa Horticultural Society, Mr. Kauffman, of Des Moines, stated that he and other plum cultivators had been very successful in fighting the plum curculio, gouger, &c., by burning coal tar under the trees. The tar is procured from the gas works, and a pint is poured into a long-handled frying pan. It is then set on fire and carried about among the trees, so as to give them all a thorough smoking. The smoke is very dense, and blackens both fruit and limbs, lasting for several days if there is no rain to wash it off.

As this has actually been tried, and has been successful, it is worth trying generally, the remedy being cheap, easily applied, with very little trouble. Mr. K. declares that the pests will never touch the smoked fruit at all. This is, indeed, "important if true."

One of my neighbours was very successful, several years ago, in fighting the curculio, by hauling old logs and other trash into the orchard, which, when set on fire, burned and smouldered for several months. The supply of smoke was continual from the time the fruit set till the first of July. After that it was not needed, and a crop was grown which sold at $3 a bushel as fast as it ripened.—*Practical Farmer.*

Live Stock.

Select and Save Your Best Sheep.

We are sorry to record that the prevailing practice with many keepers of sheep is to select and sell the best of their flocks, rather than to call out the inferior members and keep none but such animals as will tend to improve the appearance and value of the flock. A writer in the Michigan *Farmer* states that there will be a disposition to sacrifice sheep and render their carcasses for the tallow, on account of the low price of wool. We recollect the scare of 1869, and we also recollect that those who held on to the wool production made the money, and we apprehend this will again be the case.

It is earnestly recommended that wool growers cull their flocks and turn off all inferior, non-productive sheep, but let no one imagine that the bottom is about to fall out of the business. There are altogether too many sheep which will yield only two and a half to three pounds of wool. No sheep should be retained that will shear less than four pounds of wool; turn off all this low kind of trash, and the best time to test their value is at the time of shearing. Then mark every sheep for the shambles that does not come up to the standard. It is time wool growers abandon the use of scrub rams and scrub ewes. It is time that all half breed bucks were sent to the shambles. There should be a more active demand for the best thoroughbred rams. There should be an advance along the entire line of sheep breeding. We wish our voice could reach every flock master in the State with such potency as should compel this season the slaughter of every scrub ram in the borders of the State. The best flocks are the ones that are going to pay. It is with sheep as it is with swine or cattle—there must be selections—flocks must be culled—some pains must be taken with breeding stock. All we can say is let the man who has a good flock of sheep keep making it better. Resolve to add one pound of wool to each fleece the next season. After the culls have been separated from the better sheep, let them be disposed of at some rate. Better sell such culls at fifty cents per head than to attempt to bring their condition up to a desirable standard. Summer is the true time to assort flocks. Many flock masters defer this job until autumn. By separating the culls now, the selected sheep will have the advantage of better feed until the end of the grazing season. In the management of sheep it will be better to take a conservative course, pursue it steadily, do not be carried away with the cry of cheap wool, but aim to keep a flock of sheep on your farm. There are many considerations in favor of keeping a few sheep on every farm. They are good fertilizers; they afford some variety to farm life; they are a food-producing animal; their wool will always sell for cash at some price, and they are easily handled and their product cheaply marketed.—*N. S. Herald.*

Educating Horses.

Horses can be educated to the extent of their understanding as well as children, and can be as easily damaged or ruined by bad management. We believe that the great difference found in horses as to vicious habits or reliability, comes more from the different management of men than from variance of natural disposition in the animals. Horses with high mettle are more easily educated than those of less or dull spirits, and are more susceptible to ill training, and consequently may be good or bad, according to the education they receive. Horses with dull spirits are not by any means proof against bad management, for in them may often be found the most provoking obstinacy or vicious habits of different characters that render them almost entirely worthless. Could the coming generation of horses in this country be kept from their days of colthood to the age of five years in the hands of good, careful managers, there would be seen a vast difference in the general characters of the noble animals.

If a colt is never allowed to get an advantage, it will never know that it possesses a power that man cannot control; and if made familiar with strange objects, it will not be skittish and nervous. If a horse is made accustomed from his early days to have objects hit him on the heels, back and hips, he will pay no attention to the giving out of a harness or of a waggon running against him at an unexpected moment.

We once saw an aged lady drive a high-spirited horse, attached to a carriage, down a steep hill, with no hold-back straps upon the harness, and she assured us that there was no danger, for her son accustomed his horses to all kinds of usages and sights that commonly drive the animal into a frenzy of fear and excitement.

A gun can be fired from the back of a horse, an umbrella held over his head, a buffalo robe thrown over his neck, a railroad engine pass close by, his heels bumped with sticks, and the animal take it all as a natural condition of things, if only taught by careful management that he will not be injured thereby. There is great need of improvement in the management of this noble animal; less beating wanted and more of education.—*In-Door and Out.*

Ringing and Handling Bulls.

Now that more attention is given to improving farm stock, a bull is kept upon nearly every large farm. The high-bred bulls are spirited animals, and are exceedingly dangerous if the utmost caution is not exercised in managing them. Experienced breeders are not unfrequently caught unawares, and unceremoniously lifted over the fence, or forced to escape ingloriously from one of their playful animals, or even seriously injured by the vicious ones. It should be made a rule, wherever a bull is kept, to have him ringed before he is a year old, and brought

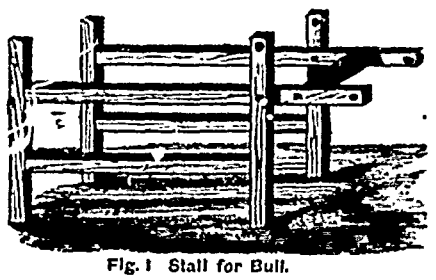
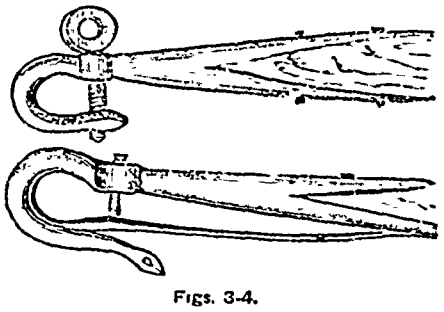


Fig. 1 Stall for Bull.

Fig. 2.

under subjection and discipline at an early age, while he can be safely and easily handled. Some time ago we assisted at the ringing of a yearling bull, which severely taxed the utmost exertions of six persons with ropes and stanchions to hold him. A slip of the foot might have caused the loss of a life, or some serious injuries. To avoid such dangerous struggles, a strong frame, similar to that in figure 1, in which to confine the bull, may be used. The frame consists of four or six stout posts set deeply in the ground, with side bars bolted to it, forming a stall in which the bull can be confined so that he cannot turn round. The frame may be placed in the barn-yard or a stable and may be made to serve as a stall. At the front, a breast bar should be bolted, and the upper side bars should project beyond this for 18 or 20 inches. The forward posts project above the side bars some inches. The ends of these posts, and the side bars, are bored with one-inch holes, and at the rear of the frame there should be tenons or iron straps to receive a strong cross bar, to prevent the animal from escaping, should the fastenings become broken or loosened.



Figs. 3-4.

The bull, led into the frame, is placed with his head over the breast bar, and the horns are tied with ropes, an inch in diameter, to the holes in the bars and posts. He is then secured, and his head is elevated so that the trochar and cannula can be readily used to pierce the cartilage of the nose, and the ring inserted and screwed together. Before the ring is used, it should be tested to ascertain that it is sound and safe.

When the ring is inserted, the straps shown at figure 2 should be used, for the purpose of holding it up and out of the way, so as not to interfere with the feeding of the animal until the nose has healed and become calloused. The straps may be left upon the head permanently, if desired, when the front strap will offer a convenient means of catching him by the staff, when necessary to do so in the field. The staff is a matter of the greatest importance. These should be made of the toughest ash or hickory, and not less than five feet long. With a staff of this length, the herdsman can check the wildest bull, and by resting the but-end of it upon the ground, can throw the animal's head up, and prevent him from approaching too near. The hook of the staff is shown of two kinds at figures 3 and 4. One is furnished with a spring by which it is closed. A metal bar attached to the spring and passing through a hole in the staff, prevents the ring from slipping along the spring. The other is provided with a screw by which it is closed. The former is preferable, as one is not obliged to approach very near to the bull to secure the hook. The forms of staff and the head straps here illustrated are used by Mr. Woodward, of Tewkesbury, England, and are well worth adopting here by those farmers and breeders who do not already use either these or equally good substitutes. The illustrations of the head straps and staves are reproduced from the *London Agricultural Gazette.*

Suggestions about Breeding.

BY PROFESSOR JAMES LAW.

1. A perfect development and sound, vigorous health, constitutionally, especially in the generative organs, are conditions of fertility.

2. In the maintenances and improvement of a breed, the truth that "like produces like," that the reproductive germ will stamp upon the animal developed from it the characters of the parent organism, is the backbone of success.

3. We can, in a great degree, at will produce variations and improvements in breeds, as by abundant feeding, a mild and salubrious climate, a rich and healthy soil, moderate use, education, stimulation, or selection of desirable qualities; by disease or rejection of undesirable characters and properties; by soliciting the weight of imagination in our favor; by allowing the breeding animals to mix only with those of the stamp desired; by crossing less improved breeds systematically with mates of a better race, and by crossing animals faulty or deficient in some particular point with others in which this point is developed in excess.

4. The herding of pregnant high class animals with low bred ones, and the resulting attachment between the two races are to be especially avoided, as occasionally affecting the progeny injuriously; strong impressions from a new or unusual condition of surrounding objects are to be equally guarded against.

5. If a valuable female is allowed to breed to an inferior male, she cannot be relied upon to produce pure bred animals for several succeeding pregnancies. Through a strong and retained impression, through the absorption into the system of living particles (germinal matter) from the fœtus, or through some influence during pregnancy on the ova, then being most actively developed, the good or bad features of the first sire are perpetuated in the progeny of succeeding ones.

6. All breeds show a tendency to "breed back," or to produce offspring bearing the marks of their less improved and comparatively valueless ancestors; hence, individuals of this kind must be rejected from the best breeds if we would maintain their excellence.

7. Certain races and individuals have their characters more fixed, and will transmit and perpetuate them in greater proportion than others with which they may be crossed. If their qualities are desirable, they prove highly valuable in raising other stock of greater excellence. If undesirable, they will depreciate the value of any stock crossed for many generations. That fixity of type, however, is above all, a characteristic of those which have been carefully selected and bred up to a certain standard for many generations, so that in our best, longest established and most esteemed breeds we have a most valuable legacy left us by the successful breeders of the past with which we may mould our inferior races almost at will.

8. While breeding continuously from the nearest relations tends to a weakened constitution, and the aggravation of any taint in the blood to sterility, these may be avoided by infusing at intervals fresh blood of the same family which has been bred apart from this branch of it for several generations. Moreover, the highest excellence is sometimes attained only by breeding very close for a time.

9. Diseased or mutilated animals are generally to be discarded from breeding. Mutilations resulting from disease existing during pregnancy, and disease with a constitutional morbid taint are, above all, to be dreaded as transmissible.—*N. Y. Herald.*

Lambs Dying From Swallowing Wool.

Numbers of lambs everywhere die from obstruction and inflammation of the bowels caused by the swallowing of wool; which, although taken up only in small quantities at a time, gets agglutinated and rolled into considerable balls, on which each lock or thread of wool is rolled until one or two of these foreign bodies block the orifice opening from the true stomach into the bowels, or are lodged in the small intestines, causing spasms and by-and-bye inflammation which is evidently difficult to relieve. Hair balls of a similar character and producing similar injurious effects occur in calves from their licking themselves and their neighbors, and also occasionally in horses. But the wool which has apparently destroyed your neighbor's and your own lambs is not, as you suppose, licked up from the grass. More commonly it is pulled from the udder and belly of the dam by the hungry lamb whilst vigorously seeking its early food. The obvious remedy, so frequently had recourse to, is the trimming away of any wool from the udder and belly of the ewe immediately before or after lambing. To relieve the lambs which have already swallowed such portions of wool, and which are recognised by dulness, abdominal fulness, and ineffectual diarrhœa, they should have small doses twice a week of castor-oil and laudanum, which will gently move the bowels, and will bring away the balls of wool, if they have not become too large to pass along the narrower portions of the canal. A long cold spring, such as we have experienced, increases the mortality from this as from so many other diseases; the weakly lambs are unable to bear up against any untoward condition. The ewes, besides having little milk, their offspring come often and vainly pulling at the empty vessel, are thus more apt to have mouthfuls of the dangerous wool. *North British Agriculturist.*

Cutting off the Tails of Lambs—Shearing.

In reading a letter in your last issue, from my friend, D. H. Thing, of Mount Vernon, Me., on "Lambs and Calves," I was very much interested, and agread with him in all but one thing, and that is in regard to cutting off the tails of the lambs. I have become convinced that cutting off the tail is injurious for several reasons, which I will state. First, it is a barbarous treatment to a little, tender lamb; it also weakens the constitution by taking from it a portion of the spine or backbone. Secondly, it deprives them of what nature has wisely given them to protect the bag from the scorching rays of the sun, which prevents the bag from becoming sore and scabby; it also deprives them of the means of brushing flies and all annoying insects from their bag and legs; but, as a matter of economy, there is a loss in the amount of wool. My shearer told me he would shear any flock of sheep for what wool was on the tail up to where it is usually cut off, which would amount to about ten cents, the price of one-fourth of a pound of wool, which is really quite a per cent. I have, for a few years past, sheared my sheep from the first to the middle of April. I am satisfied that they will do better than to let them run into warm weather. It frees them from ticks, and if there are any on the lambs, one can get them off before going to the pasture. Another advantage is, the wool, before it is exposed to the spring rains, is heavier with gluten, which makes a large per cent. difference in the weight, and as the manufacturer finds no fault—the wool working better—it is better to retain it. Some of our fancy breeders here are adopting this system of shearing in April. From some cause, unknown to me, farmers have lost a great many lambs this spring, not from the poor condition of the sheep, but from some cause unaccountable, some of our best and fattest sheep doing well with their lambs until two months old—at that age they grow weak and languid, and die.

Up to this date but little has been done in the farming line, only here and there a piece of wheat or oats sown. Grass has wintered well and is looking promising for a good crop.—*H. G. Abbott, in N. E. Farmer.*

Cruelty to Sheep.

The *Pall Mall Gazette* says: "An interesting question was raised in a case which came before the Woodbury police court, near Exeter, on Monday, when a butcher of Sedmouth was charged with cruelty to a sheep. It appears that the defendant bought some sheep at an auction and with a pair of shears cut off the tops of their ears, in some cases cutting off as much as half the ear. He did this to "mark them". It was urged in defence that it is the usual custom among farmers and butchers to mark sheep in this way. A veterinary surgeon said the sheep suffered little or no pain, the vessels being few and small in the ear. Ladies had their ears pierced for rings and did not suffer from the operation. He (the veterinary surgeon) "would not mind having part of his own ears cut off". It was less painful, he added, to the sheep to cut off their ears than their tails. The defendant was nevertheless fined £5, much to the surprise, it is stated, of several farmers and butchers present. There is certainly no evidence to prove that, although the veterinary surgeon would not mind having his ears clipped, the sheep were equally indifferent to this disfigurement and the annoyance attendant on the operation. Moreover, the fact that ladies having their ears pierced, is no argument in favour of cutting off sheep's ears. Any proposal on the part of husbands to nip off their wives' ears for the purpose of distinguishing them from other people's wives, would, it may be imagined, be received with disapproval, and increase the animosity with which man is regarded by woman."

We never did believe it right to inflict the cruelty of docking or cutting off the tails of either colts, hogs or sheep.

Profits of Mutton Sheep.

A correspondent of the *Practical Farmer*, residing within twenty five miles of Philadelphia, states that one of his certain and reliable sources of profits from year to year is keeping sheep. When I first began farming twenty years ago, he writes, I depended entirely upon Southdowns. They have always proved with me prolific breeders, capital nurses, hardy and good feeders, and my Southdown mutton ranks in the market with "gilt edge" butter. I inform my regular customers when I am going to have a fine leg or loin of pure Southdown, and they go off fast at three to five cents above the market price. In fact, Southdown mutton is the best mutton in the world.

If quality of meat was the only desideratum, I would make no change, but as coarser wools now bring the highest price, and as perhaps I gain a little in the weight, of which I am not altogether certain, but at least do not lose any, I have made one cross on my flock of one hundred ewes with the Cotswold. The best result and the finest carcass have resulted where the Southdown buck was used on the Cotswold ewe. I do not want any finer sheep than this makes, and I try to keep them for my purpose one half Southdown and one half Cotswold. What lambs I have to spare are all sold in advance to your butchers at about eight dollars per head. I raise roots, which I consider are indispensable in the sheep business, and with good management I have the lambs in the market in March and April. I consider the roots make a good substitute for grass, keep them in good heart and with fine health for early pasture. It promotes the flow of milk and appetite. I have always followed the advice in your paper to keep all my animals healthy and thriving. If they once go down or become stunted, much of one's feed is thrown away. Two-thirds of my ewes usually have twins. With lambs at eight to nine dollars each, and wool at fifty cents per pound, your readers can figure up my profits on one hundred ewes.

Crossing for Improvement of Common Sheep.

A correspondent asks us the following question:—"What is the best cross upon our common sheep for quality and quantity of wool, for the general market, and for weight of carcass?"

This inquiry can be replied to from so many standpoints, that an opinion in favor of either of the recognized breeds requires certain explanations. A cross of the long-wool—say Cotswold, Leicester or Lincoln—will insure an increase of carcass to nearly or quite double the value of the common, or native, dam. The fleece will have additional length, considerable improvement in style, and a perceptible increase in weight. The improvement in length and lustre will add to its market value.

A cross of middle wool—say Southdown, Shropshire, etc., will add greatly to the quality of the meat, somewhat less, though considerable, to its quantity; will thicken somewhat the fleece, and give it slight additional weight, without adding much to its value per pound.

A cross of the American Merino, will make a marked improvement in fleece—adding to all its desirable characteristics, except that of length. The weight, in many instances, will be doubled, while in any other than an anomalous condition of the market, the value per pound will be somewhat increased. The size of carcass will not be increased, though its compactness and symmetry of outline will be greatly improved.

With the average farmer the more satisfactory results will be secured by a cross with the long-wool breed, or the fine wools. The one will show its chief improvements in the carcass, the other in the fleece—though the merits of neither will be confined to these prominent characteristics.

As a rule, the least satisfactory results will be derived from a cross with the "Downs"—this, not from any defect in the breed, *per se*, but rather from less diversity in size in the one, and character of fleece in the other. Sheep from this cross may reasonably be expected to withstand the hardships, sometimes privation, incident to the lot of the flock when compelled to work its living off the average farm, with better results than would be realized from a long-wool cross similarly treated—and, for "roughing it," would prove nearly equal to the results of the Merino cross.

In view of these considerations, added to some minor ones, that may be classed as results of taste rather than experience, as a general proposition, we would advise a cross of the Merino in preference to the others referred to—always with the recommendation that the best rams within reach of the means of the flock-owner be used—and that none of the male animals of the cross be used as sires, no matter how near the desired standard they may approach.—*N. Y. Stock Journal.*

Cows, says the *North Carolina Journal*, have almost become the medium of exchange hereabouts since the scarcity of money. A thin cow passes for $8, a cow in good winter order goes for $10, and a bang-up fat cow is $13. In time we presume calves will be used for small change.

CURIOUS LAMBING INCIDENT.—During the present lambing season at Borthaugh, Roxburghshire, a five year old Cheviot ewe dropped a lamb on the 17th of April, which lived till Saturday the 13th of May, when it died. The shepherd then found another lamb, which the ewe accepted and nursed. On the 14th of May, just twenty-seven days after she had dropped the first, the ewe gave birth to another lamb, which is alive and is following and being nursed by its dam along with the set-one.

MIDDLE-BRED PIGS.—According to the *London Field*, the middle-bred pigs are "a something between the large and small sorts—a cross breed for which the Royal Agricultural Society has not found a distinctive title." At present, says the *Field*, there is considerable variety, according to the preponderance, of either sort. The result, however, is a highly useful breed, which finds increasing favor with the tenant farmer. They have size, aptitude to feed, flesh without coarseness, hardy constitution and productiveness. They are equally valuable for pork or bacon. The breed is said to be much liked in England by those who have tested it.

EXPERIMENT IN FEEDING. A writer in the *Kansas Farmer*, in considering the question of how to make money farming, mentions several experiments in feeding stock by men who could not command money to purchase stock. One feeder took 40 head of three-year-old steers, the 20th day of October, to feed, for 5c. per lb. for all the gross weight he could put on till the 20th of February. He had a great deal of soft corn that was not merchantable, and he gave the cattle all they could eat. He fed them four months, consuming about 50 bushels of corn to the steer, and putting 270 lbs. weight upon each animal. This made his corn bring him 42c. per bushel, and he had hogs following his cattle, which will still increase his profits.

WEIGHT OF PIGS FOR MARKET.—It was only a few years ago that swine breeders were vieing with each other for the greatest weight of carcass; but this is now all changed. Hogs that will weigh 500 pounds are sold at a less price per pound than those of 250 to 300 pounds. The market in England has long favoured light weights. London is chiefly supplied with pigs of less than 200 pounds weight. And this tendency of the market to pigs, well fatted, but of small weight, is just what the farmer should encourage, for it is exactly in the line of his interest. It costs more to make the second hundred pounds of a pig than the first, and still more to make the third hundred pounds, and so every pound added becomes more expensive.—*Wallace's Monthly.*

PEAS FOR CATTLE.—A. W. Stokes, Hernando, Miss., says: I have for years kept fatter cows and had more milk and butter, and for less money, than anybody I know of. First—I sow peas broadcast, three pecks to a bushel per acre, in the month of May, harrowing them in after breaking the ground well; then, in September, I pull them up just when a few begin to dry, and make hay out of the vines and peas. I get from 4,000 to 5,000 pounds per acre of hay that is eaten by cattle and horses as eagerly as if it were the best clover. Pulling up is far preferable to mowing, as cattle seem to love the roots better than the tops, and it is said to be more nutritious. No manuring is necessary, and one acre in sowed peas is worth six of fodder.

RAW V. COOKED ROOTS AS FOOD FOR CATTLE.—Dr. E. Wolff, a German chemist, reports the following experiments in feeding roots to cattle. Two cows were experimented on, which together weighed 1,650 lbs. They received daily, during the whole time, 8¼ lb. of hay, 31 lb. of oat straw, 4½ lb. rapeseed cake, 4½ lb. of lentil straw, and the roots mentioned in the following table, which also gives the weight of butter and milk produced in the several cases.—

Week of Experiments	Food.	Milk per week.	Butter.	Milk to 1 lb. Butter.
	lb.	lb.	lb.	lb.
First, Raw beet	82½	248½	8¼	30
Second, raw potatoes	82½	282½	6¾	42
Third, cooked beet	125¼	288½	9¾	30
Fourth, cooked potatoes	82½	218½	9¼	27

From the above it will be seen that cooked potatoes greatly increased the butter, without adding so much to the volume of the milk as raw ones, which made the milk of a thin and watery appearance.—*Eng. Ag Gazette.*

The Dairy.

Shrinkage of Cheese.

Mr S. Littlefield of Plymouth, Wis., who seems to have had pretty fair success as a cheese maker, has given some statistics in regard to the shrinkage of cheese while curing, under favorable circumstances. He has two rooms for curing. The upper room is kept at a temperature of about 70° by a fire below. When the weather occasionally runs that room up to about 80° it is tempered with ice, and when days of that kind get rather frequent, the lower room is used. He says the lower room will be at least 10° cooler than the upper. During the summer of the past year it several times reached 73°, but went above that in only two or three instances. Whenever the temperature fell below 60° a fire was built, and during a large part of the autumn a constant fire was necessary.

Mr L. makes a cheese weighing about forty-seven pounds, and he finds it will loose weight in curing in the rooms as above described at the rate of 4½ to 5 pounds on 100 pounds during the first 20 days; after this the loss in weight is ¾ to 1 pound per 100 in every 10 days. He says a careful weighing of cheese kept 30 days in different parts of the room, under a difference of 3 to 6 of temperature, the cheese in the warmer part of the room made a loss of 1 pound more on 300 pounds than the cheese kept at a lower temperature.

The shrinkage of cheese kept for long periods in badly-constructed curing-rooms is very considerable, and often much more than is imagined by those who are not accustomed to test shrinkage by resorting to the scales from time to time.

Preparing Rennets.

Whey is better than water for soaking rennets. The whey for this purpose should be purified by raising it to boiling heat, when the albumen and oily matter will rise to the surface and may be skimmed off. The whey is then set aside to cool, when the rennets are added, with salt, and after soaking two or three days, they should be well rubbed out to extract their strength, and this should be continued from time to time for several days. Then strain the liquor off through a fine cloth into a clean stone crock, and it is fit for use. Add more whey to the rennets and soak and rub out as before, when their virtues will be nearly or quite exhausted, and the skins may then be taken out and thrown away. Rennets should always be soaked in stone jars, as the ferment penetrates wooden vessels, which soon taint, and when once tainted they spoil the rennet and cause trouble in cheese making.

The rennet jar should be set in a cool place and the liquor well stirred from day to day, when dipping out the measure required for coagulating the milk. Great care should be taken to use none but good, sweet rennets, for a bad rennet soaked with a batch of good ones will contaminate the whole, rendering the liquor unfit for use.—*Rural New Yorker.*

Saving Rennets.

We have tried several ways in our practice—stretching the skins on a hoop or crotched stick—filling them with salt packing them in a cask with salt, &c. But of late we have adopted the Bavarian plan, which consists in inflating the skin like a bladder, tying the end tightly to retain the inflated condition until the skins are perfectly dry. Salt should be used freely at the point where the orifice is tied to hold the air, but as the other parts dry down quickly, none is needed, except, perhaps, in very hot weather.

The skins on removal from the calf, should not be soaked or washed with water. They should be turned and emptied of their contents, and all dirt wiped off with a cloth. Then turning the skin back again, insert a quill or tube and inflate as you would a bladder, tying the orifice as before stated. They should be hung in a dry atmosphere, but not near a hot stove, as high heat has the effect of injuring the strength of the rennet. In saving rennets great care should be taken to select only from healthy calves. If the stomach is badly discolored or shows signs of having been inflamed or diseased, it should be discarded at once, for such rennets work mischief and cause taints to be developed in the cheese.—*Rural Home.*

Preparing Milk for Consumption.

The practice most in vogue among milkmen, furnishing milk for city consumption, says Mr. Willard in the *Country Gentleman*, is to have a pool of cool water in the milk house. There is a constant flow of water in and out of the pool. The milk is placed in cans 8 inches in diameter by 20 inches deep, which are sunk in the pool, care being taken that the water comes up a little above the line of the milk in the cans. The flow of water in the pool should be sufficient to cool the milk to 60°, or a little below, in the space of one hour.

When the distance from the farm to the town is not far, we have seen milk kept in good order by being placed in the delivery can and setting it in a vat of water by the side of a penstock, the water being allowed to fall over the top of the can. In such cases the delivery cans were small. The trouble of cooling milk massed in large quantities is that the milk is not cooled even, the centre of the mass remaining warm much longer than those portions in near contact with the water. Hence the advantage of the small cans first mentioned. By stirring the milk frequently in the larger cans, the objection referred to is partly overcome.

One of the best coolers for preparing milk for market is the English refrigerator used by brewers for cooling beer. In this apparatus a very small quantity of cold water passing upward in a very thin stream between two corrugated sheets of metal rapidly abstracts the heat from two very shallow streams of milk descending outside the corrugated metal sheets. The water is admitted at the bottom of the apparatus, and passing upward between the corrugated sheets, is discharged on the side at the top. The milk is received in a reservoir or pail provided with a faucet which regulates the flow of the milk as it falls into a metal trough perforated with holes for the purpose of distributing it along the top of the corrugated plates. In this way the milk is spread into so fine a sheet that instead of falling rapidly from step to step, it follows the corrugations of the surface, and finally at the bottom is collected in a trough and conveyed to the milk can, which is placed beneath. In this apparatus the parts coming in contact with the milk are all exposed and can be readily cleaned. If running water from springs cannot be had, well water can be used, or water cooled with ice. It is a very convenient and effective cooler, simple in its construction and is not patented. It can be made by any tinner, and will be found useful by those who are engaged in furnishing milk for village or city consumption.

In sending milk to market, either by rail or otherwise, it is of the utmost importance that it be thoroughly cooled as soon as it leaves the cow. When milk is carted from the farm and delivered to customers in town, during hot weather, it is a very good plan to have the cans surrounded with coarse sacking which is thoroughly saturated with water when the teams start from the farm. The evaporation of the water keeps the milk cool, and in this way the cans are not affected by the atmosphere.

Making Good Butter.

The American *Grocer* gives the following directions:

1 Avoid worrying the cows in any way, or getting them excited.

2. Milk in a clean, well-ventilated place, free from all foul odors, and under shelter in rainy weather, letting the cows stand awhile, to drip and dry off, before beginning to milk.

3. Exclude all filth from the milk and strain as fast as milked. If it can be at once strained into the pan for setting, and the straining can be done without entering the milk-room, all the better.

4 The best way is to have the milk room so arranged that its temperature can be kept uniformly at about 60 degrees, and then to use neither water nor ice around the milk. Then leave the temperature of the milk to sink gradually to that of the room. The cream will continue to rise as long as the temperature is falling, and more slowly afterward. It will all be up in 48 hours. It should then be skimmed and kept at the temperature of 60 degrees until it becomes slightly acid, then it is fit to churn. If any other method of setting is adopted, it should not be one that will not keep the milk sweet 48 hours, nor one which will not permit all the cream to rise in that time. It is more or less injurious, according to circumstances, to have the temperature of the room higher than that of the milk.

5. Never let cream get more than slightly sour before churning, and churn it at 60 degrees, with a motion equal to that given by 30 or 40 strokes to the minute by a dasher covering three-fourths of the lateral space of the churn at the largest point.

6. Before the butter is gathered, and while in lumps about the size of wheat or buckwheat kernels, draw off or strain out the buttermilk and thoroughly wash the butter with clear, cold water at about 55 degrees, but do not pack the butter together. Then sprinkle on and carefully stir in, still avoiding packing, about one ounce of salt to each pound of butter. Set the butter away in a sweet, cool place, not above 60 degrees, not below 55 degrees, until the next day, when it is ready to work and pack for market.

7. The packing should be done in clean, sweet packages; and if the butter is intended for long keeping, the packages should be air-tight. They can be made so by proper use of the brine.

8. Butter so packed should be kept at a temperature not above 60 degrees, nor below 50 degrees, and in an apartment where there are no foul odors from vegetables, damp earth, or any other source.

9. The milk of sick cows or cows in heat, should never be used for dairy purposes, nor milk known to be impure from any cause whatever.

10. If from any accident, neglect, or oversight, a batch of butter is not perfect, it should not be packed for long keeping, but at once put upon the market and sold for consumption while in its best condition. But imperfect butter should never be made to eat.

Bitter Cream.

The cause and cure are both well enough known. Cream becomes bitter by long keeping; at three days it will begin to tell; after the fourth day it is unfit to be used in coffee or made into butter, spoiling both.

In summer there is little bitter milk or cream, because the cream is churned sooner than in winter, seldom reaching the third day. Sometimes, where there is a single cow kept, I have known the bitter to show on account of the small quantity of cream accumulating. The summer practice is reversed in the winter. There being too little milk to require frequent churning then—say one, and sometimes two churnings a week—we account readily for the evil complained of. The forepart of the season, when milk is in greater quantity, necessitating more frequent churning, I hear of but little complaint. It matters not how good the feed is, if the tenderest roots and hay are added, making an approach to summer feed; nor how clean the milk is kept, the most perfect milk if set beyond three days will be hurt. The writer of this has filled the vessel, leaving barely space enough for a cloth to be stretched over without touching the milk, and a snug lid put on, keeping the air out, but all to no purpose. So, in the purest air, in all the temperatures, it is the same.

It is age that spoils the cream; not only does it make it bitter, but it destroys the flavor, giving it a rank, disagreeable taste. The sooner the cream is churned or used after the milk has stood forty-eight hours, the better. If there is too little cream to churn, add the milk and churn that with it to give sufficient body to work it. If the milk has been kept in pure air, and cleanliness observed throughout, with the proper temperature, about 60°, there will not only be an absence of the bitter, rank taste, but a good quality of butter will be produced.—*Cor. Country Gentleman.*

Curing Cheese.—Mr. X. A. Willard, at a recent meeting of the Vermont Dairymen's Association, made the following points regarding temperature, the use of the refrigerator, and the proper quantity of fat to be retained in curing cheese:

1. That by proper temperature and attention in retaining a right proportion of moisture, the cheese is not only of better flavor and quality, but a saving in weight of from three to four per cent. is made to the producer over the ordinary methods of curing.

2. That by the use of refrigerator rooms, a cheese may be kept at any desirable point of flavor; and thus by holding when the markets are dull, or the weather unsuitable for shipping, the intervening space of time may be bridged over by the factories without detriment to the flavor or quality of the cheese.

3. That with our present knowledge of cheese-making a certain amount of fat in the milk is needed to make a good, palatable cheese. Hence excessive skimming, or a reduction of the fat in milk below one and a half or two per cent., is not to be recommended where the skimmed milk is to be made into cheese, unless other fat be substituted to supply the deficiency.

Milking Machines.—A writer to the North British *Agriculturist* writes: Allow me to state that I tried what I believe to be the ordinary milking machine, in a dairy of 55 Ayrshire cows about nine years ago. I first ordered one, and was so well pleased with its apparent efficiency that I at once ordered a few more, and the greater part of the milking was done for about a week with them, when I found out that the yield of milk and weight of curd had been gradually decreasing the time they were in use, so I at once put them aside and resumed hand-milking, when the yield soon increased to what it formerly was. This has been my experience of milking machines, and I consider their failure mainly caused by the total absence of any mechanical action on the teats or milk vessel, and not to the smallness of the tubes, as supposed by Mr. Littlejohn—a very simple defect which, if it existed, could easily be remedied. The young of all mammalia when sucking, by butting with their nose and pulling, bring a considerable amount of mechanical force to bear upon the teats and vessel. For instance, who has not observed a young pig when it could find nothing in the teat butt and rub with its little nose all round about it till it got its reward? In these days of dear labor, when the most indifferent class of dairymaids can scarcely be got either for "love or money," the Highland and Agricultural Society would be doing a duty that would be highly appreciated by all dairy farmers were they to offer a handsome premium to the inventor of a thoroughly efficient milking machine.

Veterinary.

Bone Spavin.

From a paper by Mr James McLaughlan on the above subject, which was read before the Montreal Veterinary Medical Association, we make the following extracts:—

Bone spavin as a rule produces lameness, sooner or later. Although so few cases have come under my observation, where one or both hocks bore thoroughly developed spavins, and yet for a number of years showed no lameness therefrom, I cannot but maintain that when we have such direct interference with this most important and complicated joint, it will some day cause lameness; and whether the lameness attends its early formation or subsequent growth, once bone is thrown out, the disease becomes established, and the animal is rendered unsound through life. The lameness attendant on this disease is very remarkable, and easily distinguished from any other. The animal, on starting, draws the limb up with a quick, sudden motion, and yet there is an evident dragging of the leg, indicative of pain, and a loss of action in the joint. As the horse proceeds on his journey, a perceptibly reduction of the lameness ensues, and when quite a distance is travelled, it very often disappears entirely; but allow the animal to again rest, and on starting anew, a recurrence of the lameness takes place. The departure of the lameness depends not only on the amount of exercise, but principally on the extent of growth in the spavin; if it be newly forming, the lameness may cease after a few miles have been travelled, but if it has acquired considerable growth, exercise will but slightly abate it. The degree of interference with the action of the joint by the bony deposit determines the extent of the lameness, which is further aggravated by the difficulty experienced by the periosteum, in accommodating itself to the bony growth beneath it. Veterinary practice in the treatment of this disease presents a wide field for differences of opinion to arise, and this difference is based solely on one fact. They all agree upon the necessity of reducing the inflammation as far as possible as a primary step, also upon the advantage derived from elevating the calkings, whereby tension is removed from the joint, and further the ultimate and unavoidable application of counter-irritants to destroy the lameness; but in the latter they seem to disagree to a great extent. Individually each one claiming an advantage for his treatment over all others. Some deem repeated blisters as sufficient, and leave a comparatively slight blemish.

Others introduce a seton and thereby keep up an incessant counter-irritation, and from this also but little blemish accrues. Farmers and quacks can even at this day be found who resort to the application of acids, and their success is generally characterised by the destruction of the entire limb. But we find a number who most sensibly consider a still severer counter-irritant necessary, and with repeated success use the actual cautery, and I consider it a serious mistake on the part of those who try to discontinue its use in this respect. What we wish to produce by counter irritation in the spavin, is an increased effusion of lymph by exciting extreme inflammation, and as the effused lymph is quickly converted into bone, and a complete union of the joint effected, the sooner this is accomplished, the sooner is the lameness removed; and the celerity with which this result is attained by the use of the firing iron, compensates for the pain of the operation and resulting blemishes.

Lameness in Horses.

Seedy toe is a form of defective hoof which is more common than is usually apprehended; the diseased state of the structure, not being indicated by any external marks, commonly escapes notice until lameness results from extension of the diseased condition to the sensitive parts of the foot, when an examination leads to the discovery of the nature of the affection.

Opinions differ as to the actual cause of seedy toe; some contending that the defective state of the hoof arises from some imperfection in its texture, owing to derangement of the secreting structures from which it is formed; others looking upon as a mere consequence of the mechanical separation of the horny fibres from each other by the presence of dirt introduced from below. Between these conflicting views the facts remain unaltered. Seedy toe is in reality the separation of the outer part of the hoof horn from the inner layers, forming a cavity which is filled with dirt introduced from below. Whether the dirt is the cause of the condition, or merely associated with it is a point for further inquiry. The fact is undoubted that the space between the external and internal layers of hoof is always filled up with gritty material derived from the surface on which the animal has been in the habit of moving.

The injury to the wall is most marked at the ground surface, on which the entrance to the cavity was shown by a light colored spot of oval form, about an inch in the long diameter. On making a clean section through the centre of the spot up to the coronary surface, it was found that the cavity extended to within an inch of the coronet, as shown in the drawing, which is taken from a thin slice of the diseased hoof rendered transparent. An examination of the section will show how lameness is caused. As long as the walls of the cavity remain of sufficient thickness to resist the pressure of the accumulated dirt which is constantly being pressed in from below, no pain is felt by the animal, but as the substance of the hoof is more completely excavated, the walls of the cavity yield, and the internal part of the wall being most pliable, soon presses inwards to the sensitive parts of the foot, and causes lameness.

In neglected cases the inner wall of the cavity may be broken through and the dirt come into actual contact with the secretion tissues. This condition of seedy toe is difficult to treat, and, in fact, can only be effectually dealt with by surgical means —*Ag. Gazette.*

TICKS ON SHEEP Sheep well kept in winter rarely suffer much from ticks. At shearing time the ticks gather on the lambs, whose growing wool affords better protection than that of the newly clipped older sheep Dipping the lambs in a solution of tobacco water will kill the ticks. Take the coarse stems of the tobacco plant for cheapness, steep in water, and immerse the lambs, excepting their heads, wetting the wool to the skin. This will speedily kill the ticks. By having the lamb stand on an inclined platform connecting with the tub, the tobacco juice can be squeezed from the wool and used for a large flock. While cold weather lasts, feed the sheep liberally and the ticks will do little injury.

SCOUR IN LAMBS.—This disease, which frequently attacks lambs in the summer months, may be effectually met by an experienced flockmaster who is acquainted with the symptoms A day or two before the complaint breaks out, the lambs lose their liveliness and their coats become staring. The scour partakes of a dark green color, but not unfrequently it is quite black; and when such is the case the disease should be at once treated. The dose which ought to be administered to the animals is as follows:—1 oz. of castor oil, and thirty-six drops of oil of turpentine. The disease, it may be remarked, is almost invariably found to be produced by the lambs eating young and over-succulent grasses; but sometimes it is traced to unwholesomeness of the ewe's milk. The disease must be quickly treated, and it will be found that a dose of the mixture indicated will tend to greatly relieve the suffering animal. It will be found a good plan also to vary the food of the ewes a little, so that the causes which bring on the defectiveness of the milk may be removed.—*Eng. L. S. Journal.*

CURE FOR SWEENEY. —Take ¾ of a pound of fat pork and fry the grease into a salve; stir 3 handfuls of salt into the grease when warm, until it is perfectly dissolved; then bruise well three eggs, shells and all, and thoroughly mix with the first two ingredients, after they have become sufficiently cool to not cook the eggs. Apply the salve to the part affected, at intervals of three days each, rubbing the part thoroughly, then warm in with a hot iron, holding it as near the part affected as possible, so that it may be well warmed, but not burned. Three applications will generally cure; but if the sweeny is bad, more applications will perhaps be needed. The following is another cure: Take oil origanum and spirits of turpentine, each one part; wet the part affected sufficiently to irritate or partly blister. This also I have never known to fail. It is also the best remedy for corns I have ever known, only needing to wet the corn frequently, and as fast as the surface becomes soft, scrape off with a knife, then wet again, and in a short time it will be gone. I have known it to cure some of the worst corns.—*Cor. Country Gentleman.*

HORSES INTERFERING.—A correspondent of the *Country Gentleman* had a valuable mare that interfered so as to be worthless as a roadster, and tried a plan to cure her which he describes thus: "I took an old boot leg, and cutting out the seam, I fitted an ankle, about six inches long, reaching below the joint, as well as I could when dry; then soaked, stretched and worked it, till it fitted like the natural skin, and lacing it up behind with shoe string (one below the fetlock), I left it on to dry. After marking and cutting out an oval hole about two and one-quarter inches long horizontally, and one and one-half inches vertically, over the wound, I cut a piece of tin a little larger than the hole, and shaped it with a tinman's round-faced hammer, in a concave block, about like a longitudinal third of a hen's egg. I soldered No. 14 tinned wire around the edge, and a second thickness of tin across the centre, to strengthen it; punched thread holes one-fourth of an inch apart inside the wire, and sewed it to the leather. The wound was thus entirely guarded, and the leather fitted so perfectly that there was no turning around or moving up and down to cause chafing. I could ever after drive days or weeks with impunity, and as the hair and leather were alike in color, hardly any one would notice the protector, which was the most perfect thing for the purpose I have ever seen. I doubt its being materially improved. The guard may be cast iron."

AN EXCHANGE, remarking on the chafing of the breasts of horses, says:—The common practice of using pads of sheepskin under the collar is objectionable, especially in warm weather, because it accumulates heat and makes the breast tender A better way is to take a piece of thick and smooth leather, cut it out just the size of the collar, or a little wider, and let it lie flat on the neck and shoulders of the horse, while the collar itself moves about, and so it will prevent chafing. In addition to this, let the breasts of working horses be washed off every night with clean water.

CURE FOR WORMS.—The simplest remedy for worms in cattle, sheep and pigs, is turpentine mixed with a little feed, or given in linseed oil or gruel; two ounces for a cow or ox, and one-fourth or less for smaller animals, according to the size. Clater gives the following for adult bovines:

Linseed oil	1 pint.
Turpentine	2 ounces.
Infusion of quassia	½ pint

The symptoms of the worms being present are: General weakness and inaction, falling off in flesh, capricious appetite and appearing "hide-bound."—*Scientific Farmer.*

NAIL IN A HORSE'S FOOT:—A neighbor of mine recently informed me that he had lost a most valuable horse by a casualty by no means uncommon. A knowledge of a simple remedy would have prevented this loss. The horse trod upon a nail which entered his foot. Lameness followed, the nail was extracted, but lockjaw supervened, resulting in death An unfailing remedy in such cases is muriatic acid If, when a nail is withdrawn from a horse's foot, the foot should be held up and some muriatic acid be poured into the wound, neither lameness nor lockjaw need be feared. Why the iron should have the effect which it frequently has, and the rationale of the above remedy, I am unable to explain; but of the certainty of the counteraction of disease by this perfectly safe application, I am well convinced.—*Rural Home.*

SORE FEET IN SHEEP.—Get some calomel, have a little sack made of thin flannel, say three inches long by half an inch wide, place some of the calomel in this, and tie shut. Clean out the sheep's feet thoroughly with a soft cloth, and then spread open the cleft as far as possible, without injuring the foot, and dust the affected parts by gently striking them with the sack containing the calomel. I presume it would be better to have a dry time to perform the cure, or to keep the sheep under cover for some hours after the application. I do no paring unless the case is a very bad one. It is very convenient of application, and is much less painful than the application of blue vitriol The cure is much speedier and more certain. I have kept Merino sheep for many years, and after trying many things, have never found anything equal to this for the above, and also for collar and saddle galls on horses, while there is not a particle of danger in its application in my experience.—*Country Gentleman.*

SCROTAL HERNIA IN A FOAL.—A large number of foals —probably one in four—are born with more or less amount of inguinal or scrotal hernia, but so soon as the little animals begin to grow and thrive, the loose textures of the canal are braced up, the cremaster muscle is contracted, and the protruding portion of gut is gradually withdrawn and retained within the abdominal walls. If your foal continues vigorous and growing, this natural result will certainly occur. Endeavour, therefore, by the liberal feeding of mother and offspring to secure this healthy growth. If, however, the swelling does not gradually disappear, which it generally does before the foal is six months old, or if the protruding fold of intestine drags down more after it, or is liable to get strangulated, and cause colic pains, your veterinarian will cast the colt, remove the testicle, which probably can be got at, and by adopting what is called the covered operation, will close up the canal and prevent any further descent of the bowels. Occasionally, when the canal is unusually open or relaxed, the operator requires to bring its edges together with a wire suture.

MILK FEVER.—Dr. Noah Cressy, before the Vermont Dairymens Association, in speaking of milk fever, said. There are several kinds of fever called milk fever. The one most to be dreaded attacks the cow within the first two days after calving, usually within twelve hours. The best cow is most likely to be attacked, and usually at the third calving. If she fails to notice her calf, is listless, does not rise, and staggers at the attempt, if the eyes are glassy, and they cannot wink, head hot, and apparently in great pain, the case is one of milk fever. The treatment must be immediate, for the disease runs its course in a few hours. He would bleed freely, and physic thoroughly. Give from a half pound to a pound and a half of epsom salts, and repeat the dose in an hour or two if necessary. Give enemas of castile soapsuds to help relieve the bowels and meet the physic. Put ice on the head and give a half pint of gin, or a quart of cider, with ginger and pepper. In desperate cases, as a last resort, would give a drachm of calomel. This form of fever might properly be called brain fever, and the treatment should aim to relieve the head from the rush of blood. Other fevers may be caused by mechanical injury Many cows are killed every year by harsh and cruel treatment at this critical period. When the fever is seated in the abdomen, ice must not be used on the head. The two kinds of milk fever are entirely distinct, and require entirely different treatment. It is only the ignorant quack who prescribes a single remedy for all diseases.

The Poultry Yard.

Turkey Hints.

EDITOR CANADA FARMER.—In my last CANADA FARMER you gave a small article in reference to turkey breeding. Will you kindly inform me now how many hens I ought to keep with my bronze gobbler to insure a fair crop; also what kind of food and treatment would you advise for the young? EDMONTONIAN.

"To make assurance doubly sure," Bennet says, there should be one cock for every dozen or fourteen hens. The same writer proceeds: For a few hours after hatching, the chicks require no food at all; and then, instead of cramming them- a process in which you are likely to break their little beaks—chop up a few hard eggs with parsley and a little bread or curd; make this into a paste, and present it to the birds in the palm of your hand, or place it before them on a stone, taking care that the hen does not rob them. In supplying them with water, use such very shallow vessels that they cannot wet themselves, for the least moisture appears fatal to them. As the young turkey chick seems quite incapable of caring for itself, and the mother equally so, it is a practice with some to put a few hen's eggs among the turkey's (which must be done about nine or ten days after setting,) that these, coming out with the little turkeys, may, by force of example, teach them to provide for themselves. Unless the weather is very warm the hen and chicks should be housed for the first month. If at any time they appear sickly or drooping, put a little cayenne pepper into their food. The most critical period of turkey life is when it is about two months old, and "shoots the red." The only treatment necessary is very nutritive food, a little pepper, and good, pure water.

Brahmas Defended.

EDITOR CANADA FARMER.—In the FARMER for June I find a correspondent writing against Brahmas. Now, having kept Light Brahmas for several years, and mixed fowls for at least twenty years, I think my experience as good as his. I used to get about 30 a couple for my chickens; now I get 60 cents. I can also get from one to two cents a dozen more for eggs from my Brahmas than I can for those of common fowls And, another consideration, I never find them flying over my fence and destroying my garden more than they are worth.

J. T.

Toronto.

Ducks Dying in the Shell.

EDITOR CANADA FARMER:—If you can inform me why my ducks died in the shell when hatching, you will much oblige. I set two hens at the same time, on duck eggs, as directed in an article that appeared in the FARMER for April last. One hen had been laying in the barn in a nest of her own making, and I put thirteen eggs under her—result, 12 young ducks and 1 bad egg. The other I set in the pen—result, 4 young ducks, 7 dead in the shell, and 2 eggs broken. Now all the eggs set in both cases came out of the same basket. Why did I get such a good lot from the one hen, and such a bad lot from the other? But what puzzles me most is this: Why did not the ducks hatch out, for most of them chipped the shell before they died? I asked my neighbors, and they said thunder had killed them, so I let the matter go as "death from the visitation of Providence," but still I am not satisied, as I did not hear any thunder on the day on which my ducks were hatching. If you can give a remedy against any similar future misfortunes, you will confer favor on

A SUBSCRIBER.

The first conclusion one would naturally deduce from the above is that natural or "hen made" nests must be decidedly preferable to "artificial ones." This, however, is not always, or necessarily, the case, as is proved in the experience of every poultry-man. The deaths and consequent loss of chicks resulted probably from one of two causes viz. 1st "chilling of the eggs." 2nd, a lack of sufficient strength in the chick to make its way out of the shell. When some of the eggs got broken in the nest, you should have taken all the others out and washed them in water several degrees warmer than themselves, then wipe them carefully and replace them under the hen. During the process of washing you would also have observed which eggs were good and which bad, the former sinking, and the latter floating. When eggs get broken in a nest, the sitting hen is naturally besmeared with the escaping albumen. This she communicates to the other eggs, accompained by greater or less portions of her own down, and the result is that the shells are strengthened, and the chicks chances of escape from them materially lessened. Most probably your chicks died in the manner just explained. "Chilling" happens in many ways. A laying hen getting into a nest in which the eggs are near hatching, will chill them. Sometimes the sitting hen gets weak and has not sufficient bodily heat to hatch out when two or three chicks are obliging her continually to shift her position. A good plan in such a case is to remove the chicks as soon as they are dry, and place them in flannel near the stove. Sometimes the owner thinks he knows better than the old hen how to hatch chicks, tries it, and spoils his clutch.

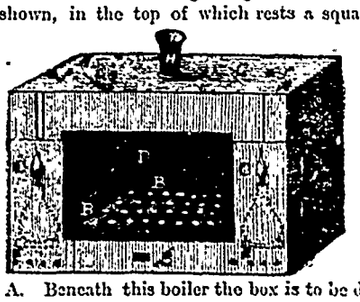
A Cheap Incubator.

EDITOR CANADA FARMER.—I have a desire to make an incubator. I noticed an advertisement in the *Poultry World*, so I wrote there, but the price asked was seventy-five dollars—quite too much in these hard times. Will you please give directions for constructing one, how the heating is done, steam condensed, pipes put in, and all that I should know in reference to the subject, so that I can make one to hatch say 50 eggs? In conclusion I must thank your correspondent, W. W. H. for the information given in the April number of the FARMER, in reference to the keeping of poultry. I find a steady increase of eggs since I commenced to follow his directions.

J. S.

London, Ont.

A cheap incubator, such as you desire, may be constructed thus: Lay out fifty eggs in five rows of ten eggs each. Measure the space they occupy, and make a shelf of the same size in which holes or "nests" are to be cut and lined with cloth for the eggs to rest in. This shelf is represented at B.B in the engraving. Next construct a box as shown, in the top of which rests a square zinc



boiler A A. Beneath this boiler the box is to be divided into three compartments C.C. for lamps, and D. for the egg-shelf which is adjusted to ascend or descend by means of cords and pulleys manipulated from without, thus regulating its distance from or proximity to the heated boiler above. E. E. are vent holes for the lamps and the corresponding ventilation above is effected by carrying small pipes *through the Boiler* at F.F., an arrangement which materially facilitates heating. G. is a small slide intended for use when it is necessary to lower the temperature around the egg-shelf. The front portion is covered with a glass face through which the process of incubation may be observed without admitting the external air. The pipe H, intended for replenishing the boiler, also serves for the insertion of a thermometer, at any time to test the temperature, which may be slightly under, but should never exceed blood-heat. The entire apparatus must be kept in a comparatively dark place and tended closely for three weeks after everything has been got in readiness for hatching. As the air around the eggs must, to a certain extent, be kept moist, a saucer containing some water and a sponge should be kept under the shelf. This can easily be effected by means of a little, close fitting drawer, near the slide G For convenience too, the glass door should be hinged above or below, rather than at one side.

The temperature within the hatching chamber should be lowered once every day, for about fifteen minutes, by lowering the egg-shelf and opening the slides.

NESTS.—A correspondent of a western paper makes the following excellent suggestions in regard to hens' nests: The nest-boxes should be moveable, so that after hatching, and occasionally when using only for laying, they may be conveniently cleaned. One way is to whitewash them; but another, preferred by some, is to kindle a fire inside and char them. This process will effectually destroy vermin and their larvæ, and will thoroughly purify the nests by leaving a coating of charcoal inside. This substance is one of the best antiseptics, and a perfect deodorizer. Boxes made of seven-eighth stuff—pine, hemlock or spruce—will outlast a number of these purifications by fire, as the process tends to preserve the wood.

The Apiary.

Separating Honey from Wax.

A correspondent sends to the *Housekeeper* the following directions for separating honey from wax: Put the honey, comb and all, in a tin pan on a moderately warm stove, adding to each pound of honey a tablespoonful of water. Stir it occasionally with a piece of wire when the contents of the pan are perfectly liquefied. It must not boil. Set it where it can cool undisturbed; then pass a knife carefully around the pan to detach the cake of wax on the top, and rapidly, with great care, lift off the cake. Don't let it drain into the pan an instant, but place it in another utensil. Any one thus clarifying honey will find, on putting aside the cake of wax, that the impurities that would otherwise have to be strained from the honey will have adhered to the cake of wax, while the honey beneath is clear. If the honey should, in time, candy, heat it again with a very little water and brown sugar. Keep it in jars tied up in a cool place. Break up the wax cake and wash it in cold water till cleansed of honey; then melt and strain it. To bleach the wax, boil it, after straining for an hour in plenty of water, in which use a few drops of chloride of soda. When quite cold lift off the wax and leave it to dry and whiten in the open air.

BROOD CHAMBERS.—My brood chamber is twelve inches square inside, the honey box large enough to receive from twenty to thirty frames from six to eight inches square. These I lift out as they become ripe. These frames I fill into boxes of different sizes some hundred pound boxes—for retail I find ready sale for this honey at from twenty-two to twenty-five cents per pound. I don't use the extractor, for it is a curse to the bee keeper. Stop the use of the extractor, and then artificial honey makers cannot take undue advantage of us, and destroy our market for our good honey. Yet there is room for improvement.—*Rural World.*

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

TO TRANSFER BEES.—If your bees are in the old square gum or box hive, approach the hive as before, and, after driving the bees up into it, remove it about fifty yards from the spot where it stood, turn it bottom up, place a box, about a foot square, in a tilted position, on top, and by rapping on the sides with a hammer, drive the bees into this box. After the bees have all been driven into the box, remove it and cover over with a thin cloth; then open the old hive and take out the brood comb; cut to fit the frames tightly, so that there will be no danger of the comb falling out, (it is best to solder with rosin and wax, but, if put in tight, the comb will stay); place the frames in the patent hive, make the entrance as large as can well be done, pulling into it, at the same time, a smooth cloth (pretty long), and then empty the bees out of the coy hive on to this cloth, and they will take possession without any more trouble, and stay there too.—*S. Cultivator.*

RAPE AS A HONEY PLANT.—As a honey-producing plant the rape is scarcely second to the linden, producing a beautiful golden honey of good flavor, and is in blossom, commencing about August 15th, and continuing a couple of weeks. As a farm crop it is as good, if not better than wheat. The time for sowing it is from the middle to the end of June. This gives time to prepare the soil after other crops are in, or, if wheat or corn should fail in coming up, rape can be sown in their places. It is harvested from the middle to the last of September, after all other grain is harvested. It does not impoverish the soil, but benefits it. From five to eight bushels more per acre of wheat are raised on ground which had rape the previous year. It lets no weeds grow after it is fairly started, growing very dense, and its leaves completely shade the ground, therefore it does not suffer from drought like other grains. The seed has a good cash market at Fond du Lac, Wis., where oil is extracted from it, and brings from $1 70 to $2 per bushel. From ten to eighteen bushels are generally produced per acre, but it is oftener over than under this estimate. Two quarts are sufficient to sow an acre. Thousands of bushels are annually raised in Calumet county, Wis., and it is just as staple a crop as wheat. Those doubting my statement, I refer to report of agriculture for 1870.

The Canada Farmer

TORONTO, CANADA, JULY 15, 1876.

Experiments with Blue Lights.

We have already recounted General Pleasanton's theory regarding the increase of temperature in rooms and graperies, by the use of alternate blue and white lights. Further experiments conducted by him and based upon the same theory are both curious and interesting. He prepared an experimental grapery in 1861, and, at a venture, adopted every eighth row of glass on the roof to be violet colored, alternating the rows on opposite sides, so that the sun in its daily course should cast a beam of violet light on every leaf within. In April he proceeded to plant cuttings of vines of twenty varieties, and soon after, their growth began and progressed so rapidly as to attract general attention. In September Mr. R. Buist, a noted horticulturist, on entering the grapery, was lost in amazement at what he saw, and said that, although he had visited some of the best vineries and conservatories in England and Scotland, in the course of an experience extending over four years, he had never seen such a growth before. On measuring some of the vines, he found them to be 45 feet in length, and an inch in diameter at the distance of one foot above the ground. In subsequent years the same remarkable growth was exhibited, the vines continuing to bear large crops of fruit without intermission ever since.

The General next proceeded to experiment on animal life. He built a piggery and introduced into the roof and three sides of it, violet-colored and plain glass in equal proportions. The experiment, though not remarkably successful, was sufficiently so to afford him some encouragement. His next subject was a bull calf, puny and feeble at birth, and in this case, the result has been "extraordinary" the animal maturing into one of the best developed of its kind. He also found similar effects from testing the efficiency of the same force on fowls and fishes; "they grew much more rapidly and to a larger size than when exposed to simple sunlight alone." It appears, from some of the experiments recorded, that it is immaterial through what medium the blue or violet light is transmitted. In one case Mr. Buist simply painted the inside of his panes a light blue, with the same effect. In another, in which a delicate child was claimed to have been restored to health, the medium was the blue drapery of its bedroom. This latter case is attested by Commodore Gainsborough of the American service. And a third, still more noteworthy, was that of a Philadelphia physician's wife, whose case had been despaired of by the medical fraternity, but who "rapidly and entirely recovered under the influence of the blue light." Such is the testimony afforded regarding this new theory, which, however, will be received with an ample admixture of caution until each one has tested the matter for himself.

Dangers of Spontaneous Combustion.

Several instances having been recorded recently of fires originating apparently from old, greasy dish-cloths thrown away on kitchen waste-shelves, men of science have given their attention to the subject and, after careful experiments, announce the following curious results. It is determined by experiment that a handful of cotton waste soaked in boiled linseed oil, placed in a chamber at a temperature of 170 deg. Fah., will take fire in less than two hours. If raw linseed oil be used, the time occupied is from four to five hours, and with rape oil about six hours. Gallipoli oil takes about the time last mentioned, under 132 deg. Fah. Castor oil, under like circumstances, is very slow, and at the end of two days, waste saturated with it only became a mass of charred cotton. Lard oil produces rapid combustion in about four hours. Sperm oil, on the other hand, refuses even to cause a charring of the waste. Seal oil, of a strong fish colour not unlike sperm, has produced rapid ignition in one hundred minutes, temperature being as last stated. The heavy oils from coal and shale, being chiefly the higher oleflines, have a remarkable effect in preventing oxidation, through giving a certain protection from the air. Mixtures of these oils with 20 per cent of rape oil gave no indication of heat whatever at 170 deg. Fah., and even seal oil, with its own bulk of mineral oil added to it, did not at 135 deg reach a temperature sufficient to char cotton. As a general rule, it may be laid down that spontaneous combustion of refuse, soaked with vegetable or animal oils, will occur whenever the conditions are such that a temperature of at least 175 deg continues for several hours. Cotton will burst into flame, wool, on the other hand, becomes a blackened mass. Equal weights of cotton and oil produce the most rapid inflammation. Combustion may be checked or stopped by the addition of mineral oil. Wherever vegetable or animal oil (other than sperm) is largely used, therefore, whether for lubricating machinery or oiling tissues, it would seem to be a safe precaution to add to it as large a proportion of mineral oil as possible, if such addition can be made without interfering with the use of the material.

Canadian Horses for England.

The suggestion, first broached by the CANADA FARMER, as early as April last year, relative to the raising of Canadian horses for England, has, we are glad to observe, not been without effect. By recent English advices we learn that a number of animals purchased in the neighborhood of Toronto and Montreal, arrived in London last month by the Dominion line. The cost of transit was $50 a head from Montreal. The average price at which they were bought here was $120, and in England they sold readily at from £55 to £60, ($275 to $300). One fine upstanding bay horse, which cost in Toronto $102, was purchased for a gentleman's brougham for $315. It is further stated, as the opinion of many English judges, that Canadian bred animals are better suited to the British market than Kentucky horses, such was the interest manifested in this, the first consignment of Canadian horses, that an effort was made to put them on exhibition at the Agricultural Hall. Owing to the Horse Show however, the effort was impracticable, till most of the lots were purchased. But it is very likely that the next arrivals will be shown there. The speculation on this occasion was a private one, but it serves to show that if relative prices continue anything near what the importer has realized, Canadian farmers will find it decidedly advantageous to breed more horses.

Frozen Meat from Australia to Great Britain.

The growth of meat in Australia is so far in excess of the requirements of its people that the pastoral tenants have, according to seasons and circumstances, either to boil down the surplus, or else "tin" and export it as preserved meat. Although both these processes have been carried to a high degree of perfection, there exists a prejudice in the old country against the meat so prepared, and particularly so among the classes for whom, from its cheapness, it is thought to be best adapted. This being the case, and the matter being of too great moment to colonial interest to be allowed to languish, a Mr. T. S. Mort has come to the front and announced, after an experience of eight years at a cost to himself alone of £100,000, that he has perfected appliances both to freeze the meat exported and to keep it frozen in transit, so that, on its arrival in England, the entire carcases can be handed over as sweet and fresh as when killed. As far as successfully accomplishing all he sought for on shore, there is no doubt of that, as meat kept at the works for months has been tested by hundreds and no difference in flavor or appearance could be detected between it and ordinary butcher's meat; but of course, the stowing it in a ship's hold and sending it through all changes of climate involves a special adaptation (for the sea voyage) of means only hitherto proved suitable on shore and there is therefore a new element of risk, which his fellow-colonists have felt that he should not wholly incur, and a public meeting called for the purpose have unanimously arranged to raise £25,000 for the sole purpose of sending a trial shipment to England. Mr. Mort foregoes all claims for patent right profit, and also arranges to go personally in charge, so that in the event of there arising some unforeseen difficulty, his inventive genius may be at hand to promptly remedy or remove it. Over £18,000 has been already collected towards carrying out the experiment, and we may therefore expect to hear within a very short time of 500 tons of frozen fresh meat being on its way from Sydney to London. Should it succeed fully, it requires no prophet to foretell what a real blessing it will prove to the whole of the lower and middle classes at home.

Canadian Canned Meat.

The premises of the North American Packing Company, located on the bank of the Lachine Canal, near Wellington Bridge, Province of Quebec, have recently been visited by members of the Montreal city council, who furnish some interesting particulars regarding the extent of the establishment, and its various operations. The cattle shed is 110 feet long, by 27 feet in width. It contained, at the time of the visit, thirty-five, distillery-fed, Ontario steers, averaging about 1,300 pounds each. The slaughter house, 50 x 45 feet, has a gutter running through it, and communicating with a large sewer by which all refuse is carried off. Here five men are kept constantly employed in skinning and dressing meat. On this occasion an animal was despatched in 13 seconds. From the slaughter-house the dressed carcase is transported, by means of a hoist, to the "boning room. This latter is about 50 feet square, and affords employment to from 30 to 50 men, who, ranged around five tables, extract all the bones. The average quantity of meat "boned" per day is 15,000 pounds. After the meat has been boned and carefully cleaned, it is taken to the "bath house," about 30 feet square, and boiled for two hours in two pound tin cans, which are arranged in iron racks or cradles, 24 in each rack, and deposited in one or other of five different baths, each capable of holding 550 cans. After boiling for the time specified, the cans are removed and their "brongues" (small soldered spaces in the top) opened to let out the air, this done, they are again closed, and the meat is subjected to five hours' additional cooking. The boilers supplying hot water for this latter process, are 14 x 4½ feet, and ten men are employed in the department. Next follows the cooling process which is facilitated by a stream of cool, fresh water being allowed to play upon the cans for about eight hours. These are finally removed to the "retort" where they are again heated, the object being to give firmness to the meat, and render it more susceptible to an equal distribution of "stock" or gravy poured over its surface. Adjacent to the main establishment is the tin can manufactory, which, with its forming machines, dies, double acting power-presses, swedging machines, paint shops &c., gives employment to forty additional men and ten girls. The bones extracted, as already alluded to, are placed in what is called the "digester," a strong metal vessel with safety valves, and subjected to a high steam pressure which causes their juices to exude in the form of "stock" or gravy for preserved soups and other similar purposes. The company's business is now very fairly established, and, according to all accounts, rapidly increasing.

Montreal Agricultural and Horticultural Society.

The Montreal Agricultural and Horticultural Society has issued its first Report on the different varieties of fruits which have proved best adapted to the Province of Quebec. A brief description is given of each variety, such as will serve as a guide to intending planters and propagators. The paper on pears partakes more of the nature of an individual report, many of the kinds enumerated having been comparatively untried, or tested to a very limited extent. Apples are adjudged in order of preference as follows. 1, Fameuse; 2 and 3, Red Astrachan and Alexander, 4, Duchess of Oldenburg, 5, St. Lawrence, 6 and 7, Peach (of Montreal, and Golden Russet of Western New York. Of Crabs, the 'Montreal Beauty," a variety almost unknown outside the province is well spoken of. The tree, says the Report, is rather large, with a very close and upright head which remains so until the weight of fruit presses it down and open. It bears heavily but

not early On young trees the fruit is large for a crab and very oblong conic. On older trees it is roundish-oblong and truncate. In old age the fruit is still fine and saleable. It ripens about the middle of September. The "Montreal Waxen," another variety, is, it appears, propagated in Ontario and the Western states under the name of "Montreal Beauty," through a mistake on the part of Mr Cleghorn or some other unknown person many years ago Accompanying the Report is a list of premiums amounting in the aggregate to $1400, to be awarded by the Society at its next exhibition, to be held in Montreal on the 12th, 13th and 14th of September next. The Society now numbers seven hundred members, and affords every evidence of being in a prosperous and flourishing condition.

Sunstroke.

EDITOR CANADA FARMER.—Referring to an article on "Sunstroke," in the last number of the FARMER, I would observe that I have always found a green leaf folded inside the crown of a straw or chip hat a very efficient protection for the head against the heat of the sun, however warm the day may be. I have tried a vine leaf, but find a basswood leaf is much better, because it is thinner and green on both sides, which a vine leaf is not. Were I living in a place where green leaves were not to be had, I should have my hat lined with thin green calico. That the light of the moon has a tendency to affect the brain is unquestionable. I have read of instances where men who have fallen asleep with the head exposed to the rays of the moon in tropical climates, had woke up in a state of lunacy. The peasants of Syria often sleep on the ground in the open air during the summer, but however warm the weather may be, they take care to keep their heads well covered by their *burnous* or cloaks, as a protection not only from the night dews, but from the rays of the moon. As regards the effect of light on vegetation, I have read an account of an experiment made by a gentleman, in England I believe, to try the effects of coloured glass on his hot-bed sashes. The solar rays, although apparently white, are in reality a compound of all colours. In the spring the green rays predominate; in early summer the yellow rays, and about harvest the red rays overpower the others. When his hot-bed was first made he used sashes filled with green grass; when the young plants were well up he substituted sashes filled with yellow glass; when the plants were farther advanced he used sashes filled with red glass; and, as might be expected, everything grew more rapidly, and matured much earlier than they would otherwise have done. But only wealthy amateurs can afford the expense of such experiments. Perhaps gardeners who supply city markets might find it worth while to try this experiment on a small scale by using sashes covered with thin calico of these three colours, as even this is too expensive and requires too much care and attention for farmers in the country, most of whose garden productions are consumed at home. SARAWAK.

Farmers' Boys.

EDITOR CANADA FARMER:—I am glad to see that farmers' sons are still attracting so much attention in your valuable paper, but I think Mr. Shisler gives them a harder name than they deserve. His remarks for instance about their preferring to lead a horse rather than work on a farm, I consider simply insulting to the average Canadian farmer's son, though, I must confess that, as both he and "Sarawak" state, many of them seem to prefer counter-skipping or something of that kind to farming, perhaps partly because it is not quite so hard work. But I have been studying this question for some time. When at school I noticed that, so soon as a boy found he could go ahead of his fellows, he seemed to conclude that he was too smart to be a farmer, and therefore insisted on having an education if possible, as he well knew he could not be a successful merchant or professional man without one, and then off he started to seek his fortune by his wits. Of course I was not at all sorry to see some of these boys leave the farm, as they were much more suitable for other occupations, but there were others well adapted both mentally and physically for agricultural pursuits, whom it grieved me to see leave for the city, or worse still, for the country store; and it still grieves me to see the same state of things continued, especially when I consider the present hard times, and remember that the wealth and strength of a nation depend pretty much on the amount of her productive labor. Now, after I have asked myself time and again, what is the chief objection these smart boys have to a farmers' life, I have concluded that it is its apparent incompatibility with intellectual and social culture; and I believe that while the country was new, this apparent incompatibility was only too real. As a rule the men who had the most physical strength, could get along best while chopping and clearing up new land. But times are changing; the world is advancing, and farming is fast becoming more of a mental and less of a physical occupation, and now that the axe, hand spike, scythe, cradle, hand-rake and suck like are giving way to the reaper, mower, sulky horse rake, horse fork, seed drill &c., a one legged or one armed man, with capital and *intelligence*, can make more on one of these old farms than the stout, hearty man who chopped and logged it, and who could get along very well while the soil was rich and strong, but, so soon as the virgin richness had gone, he lacked the intelligence to make it pay, and so had to move back and leave room for some one who knew more of the principles of advanced agriculture. And, it seems to me the time is fast coming when intellectual culture will not only be considered compatible with a farmer's life, but a necessary element in his character, and then of course social culture will follow as a natural consequence. Then would it not be well for these smart farmers' sons to learn what they can, "stick to the farm" to see if they can't do something to develope a higher and better manhood in the agricultural class, and raise it socially, intellectually and politically.

Bramley. YOUNG CANADIAN.

THE BRITISH GOVERNMENT has at length introduced a measure in which vivisectionists and their opponents appear to have found a practical ground of co-operation. It provides that all experiments must be performed in places approved by the Secretary of State (the operator also being licensed by him), and with a view only to the advancement, by new discovery, of knowledge that will be useful in saving human life, or alleviating human suffering. During the operation, the animal must be kept under the influence of some anæsthetic sufficiently powerful to prevent pain, unless there is a certificate from one of these scientific bodies, that insensibility would defeat the object aimed at. The animal must also be killed before recovering from its torpor if the pain is likely to continue, or if serious injury has been inflicted, unless a certificate (as above) has been obtained to show that such a course would frustrate the object of the experiment, and even then the animal must be killed as soon as the object has been attained. Experiments for mere demonstration are strictly prohibited, unless under similar certificate of their absolute necessity for instruction, with a view to save life or alleviate pain, and are not allowed for the purpose of simply obtaining manual skill. Lord Shaftesbury who has taken a deep interest in the question on behalf of the humane societies, while asserting that the general feeling was in favor of total abolition, still accepted the Government Bill, as going a long way in the right direction.

SOME OF OUR AMERICAN exchanges inform us that Professor Collins, of Whitefield, Maine, has invented a new method of generating light and heat. The discovery he terms "aqua" or water light. He professes that a quart of water, treated with five cents' worth of some chemical substance known to himself, can be made to produce more light than the same quantity of kerosene; and that a barrel of water, with one dollar's worth of chemicals, will produce more heat than a cord of maple. The light, he asserts, is entirely safe, and accompanied by neither smoke nor an unpleasant odour. "For ten days his laboratory has been lighted with a jet of water no larger than a cambric needle, and he will contract to warm and light any house in Whitefield, at a large reduction on the present cost, although his invention has not yet been quite perfected." Repeated applications to the professor for information, have evoked his promise that a public exhibition of this wonderful discovery will be given at an early day, in the presence of a number of eminent men of science. This exhibition will be looked forward to with interest and not a little dubiousness in view of the well-known tendency among our neighbors to invent "stories" if nothing better.

THE IDEAS BROACHED in another column relative to the use of glass hot-beds and transplantation for farm root crops, will, no doubt, induce some ominous head-shakings and not a few meredulous smiles. The bare idea of transplanting, by hand, ten or twelve acres of turnips, certainly *seems* at first sight, too formidable, too preposterous to be entertained for a moment. But we must not forget that apparent impossibilities have ere now repeatedly dwindled down into problems of very ordinary and easy solution, when submitted to the test of cool, calm and deliberate analysis. At all events our correspondent boldly asserts confidence in his theory, claiming, from the results of his own experience, that its practical application will be attended with less labor, less expense, and much greater success than the ordinary method of sowing out, hoeing and singling. We call attention to the subject, not because we endorse the new departure by any means, but because of our desire to afford any fresh light on a matter of so much importance as our Canadian root crops. Our readers will of course judge, and test for themselves.

LORD KINNAIRD recently addressed a letter to the Dundee *Advertiser* (Scotland), the import of which may be gathered from the following extract. "I observed in your journal of the 13th a letter signed 'J. A. S.' suggesting that some public memorial should be erected to the inventor of the reaping machine, naming the Rev. Patrick Bell as the first, at least, in Scotland, who invented a reaping machine which was "of service and profit in the harvest field". There is no doubt that the Rev. Patrick Bell, in conjunction with his brother, Mr. Geo. Bell, invented a reaping machine. The two brothers made a model which they used to experiment with by moonlight, for fear of anyone seeing them. They planted sheaves of corn in the ground to represent growing grain. It was, however, the practical farmer, Mr. Geo. Bell, who got the the machine made and brought into actual use. He was able to introduce several very important improvements in the working of it, and got one made for me about the year 1829, and subsequently took a farm from me, which I helped to stock. Being a first-rate practical farmer, he was enabled to take another farm from me; but, alas! he did not live long after he got possession—a very great loss to his landlord and the district generally." To this a pointed and unmistakeable denial has been published by the late Rev. P. Bell's widow. She claims that her husband alone, and unaided, was the sole inventor, and any assistance rendered by his brother was merely mechanical and under immediate directions. Her remarks are also confirmed by Mr. R. Scott Skirving of Edinburgh, who, in a letter to the *North British Agriculturist*, reminds Lord Kinnaird of the fact that as early as 1854 a complete history of the invention had been published in the *Journal of Agriculture*, giving all the facts of the case.

Agricultural Implements at the Centennial.

The correspondent of the Manchester, England, *Examiner*, writing home from Philadelphia says:—It annoys English visitors to the great agricultural hall to find how far the Dominion of Canada excels the British exhibit in agricultural implements, and when they see, besides, such countries as Brazil and Spain making really magnificent displays, their national pride is still further wounded. Nothing would have interested American farmers more than to have had an opportunity of seeing the machinery and implements used by their kinsfolk on the other side of the Atlantic, and the grains, grasses and fruits produced there; but this opportunity, unfortunately, is not given them. Of course it is undrstood in this country that the English exhibit in all departments, like the American, is voluntary, and made under very limited governmental supervision, and that, for the most part, it proceeds from commercial motives, the articles sent being such as the exhibitors believe they can dispose of to advantage here, and use as samples for future sales. It would seem, however, that if the agricultural implement makers did not find it for their interest to exhibit, we might at least have had some collective displays of farm products made by some country societies; something to compare with the exceedingly interesting and complete exhibits which the State Agricultural Boards of several of our Western States have contributed. To which the English *Farmer* adds:—Long since we predicted that the show of English-made implements would be insignificant, and for a very sufficient reason. So

long as the United States adhere to a "protective policy, they must expect that traders in other nations will try to take care of themselves. If our British agricultural implement makers had sent specimens of their best work to Philadelphia, shrewd Yankees would have speedily copied their latest "inventions," and being "protected," might undersell the exhibitors. Such being the case, we need not wonder at the "almost entirely vacant space assigned us for our farming implements and machinery.

Poisons in the Air

Pasteur, in his recent experiments on [illegible] generation, has demonstrated that the germs of low organisms, bacteria, micrococci, etc., are everywhere present in the air, they settle on the skin, in the air passages etc., and are ready to become developed in all cases where there is no individual vitality, which prevents the growth of the inferior organisms, of which they are the seeds. Healthy people, therefore, will resist their ravages, but weak sickly, and especially dead bodies, will soon be the victims of their destructive action. The air in hospitals contains myriads of them, and besides dried pus globules, spores of epithelial parasites emanating from diseased parts, and which are so volatile or light, by reason of their almost infinitesimalism, that they hover continually in the air. After some time the walls become invested with them, and this makes old sick-rooms so unfavourable for restoration of health. To prove this, Pasteur had a square yard of wall in the surgical ward of the Hospital la Pitie, Paris, which intentionally had not been whitewashed or cleaned for two years, washed with a wet sponge, and the liquid of the sponge expressed; one ounce of a black liquid was thus obtained, which, on examination by the microscope, showed large numbers of bacteria, micrococci, epithelial cells, pus globules, red globules, and irregular blackish masses of unknown nature.

Next comes Dr. Esbeth, of Zurich, and examines in the same way the sweat from the face, axilla, breast, and thigh, and finds great numbers of bacteria, which appear to originate from minute bodies attached to the hairs in those regions, forming little nodules like accumulations of micrococci.

The lesson conveyed by all this is. Practice cleanliness about every part of the body; it is not in vain that combing, washing, bathing, and rubbing gives a feeling of comfort—this feeling is a hint of nature that the human system needs it.—*M. and Builder.*

Typhoid Fever and Polluted Water.

"Typhoid," or "enteric" fever, is the common fever of this country, which spares neither age, sex, nor social condition, which destroyed the life of the Prince Consort, and nearly destroyed that of the Prince of Wales, which destroys an average of about 10,000 or 12,000 people annually and which sickens and endangers about 100,000 more. It is essentially an eruptive disease of the lining membrane of the intestines; a sort of small pox, which affects the bowels instead of the skin; and, like some other eruptive diseases, its destiny is to run a definite course over a stated period of time. It is spread abroad chiefly, and probably exclusively, by the discharges from its specific eruption—that is to say, by the discharges from the intestine. These, in the natural course of things, find their way into cesspools and sewers, and when they do so they render poisonous the solid or liquid contents of the receptacles, and also the gas which is evolved from them. The fever is reproduced mainly in three ways—first, by the poisoned sewage obtaining direct access to drinking water, by leakage or soaking, and so being swallowed, secondly, by the poisoned gas escaping from sewers into water mains or cisterns, so that it is absorbed or dissolved by the water, and so swallowed; thirdly, by the poisoned gas making its way through badly-trapped drains or other channels, into dwelling or sleeping-rooms, and so being breathed by the occupants. To one or other of these methods of diffusion every outbreak of typhoid fever may be referred, and nearly every single case, the tendency of modern research, by increasing our knowledge of the outlets for sewer poison, and of the distances which it may travel unchanged, being constantly to bring apparent exceptions within the general rule. Hence two things are manifest—first, that typhoid fever is very little infectious in the ordinary sense, or through the atmosphere which surrounds the patient, secondly, that it is very actively infectious through concealed channels of indefinite length or tortuousness, so that B may derive his fever directly from A, of whose very existence he is ignorant. The connections which constantly exist between sewers or cesspools and the water or air supply of dwellings, however, disagreeable or disgusting, are harmless, as far as the production of typhoid is concerned, until the sewers or cesspools have themselves received the typhoid poison. In towns which have an intermittent water supply, and in which mains and sewers lie in close proximity in the streets, as soon as the mains are empty of water they become filled by the sewage gas, which makes its way through chinks; and in the many houses in which an untrapped overflow pipe descends from the cistern to the sewer, the gas ascends by this pipe, and the water contained in the cistern is always more or less contaminated. In both cases the water may be made to stink, or it may be rendered more or less unpalatable or unwholesome, but it does not become a source of typhoid until typhoid poison has been cast into the sewer. There are few villages in which there is not continued soaking from cesspools to wells, but this soakage is likewise—*quâ* typhoid—harmless until the specific material is supplied. The danger of such structural defects is that they leave an open door for the entrance of the typhoid poison whenever it does get into the sewers, and the typhoid poison is so widely diffused in this country that it is never safe to speculate upon its absence. When the fever appears, the only question is, practically speaking, 'How and when does the sufferer drink water which was contaminated by typhoid-tainted sewage, or breathe air with which typhoid-tainted sewer gas was mingled? All the popular talk about 'exposed to cold, or about 'bad smells, or 'over fatigue, or other vague speculations of like kind are entirely erroneous and misleading. Typhoid may be assumed, for all practical purposes, to spring only from antecedent typhoid, and to come only by the path of sewage pollution. If it ever does arrive *de novo*, the cases are entirely exceptional, and we have no certain evidence of their occurrence. —*London Times.*

The Wild Duck's Pretence.

The Duke of Argyle, in a recent article, claims something more than instinct for the duck described in the following extract. "In walking along the side of a river with overhanging banks, I came suddenly on a common wild duck, whose young were just out. Springing from under the bank she fluttered out into the stream with loud cries, and with all the struggles to escape of a helplessly wounded bird. . . . The labored and half convulsive flapping of the wings, the wriggling of the body, the straining of the neck, and the whole expression of painful and abortive effort, were really admirable. When her struggles had carried her a considerable distance, and she saw that they produced no effect in tempting us to follow, she made resounding flaps upon the surface of the water, to secure that attention to herself which it was the great object of the manœuvre to attract. Then, rising suddenly in the air, she made a great circle round us, and returning to the spot, renewed her endeavors as before. If we now examine, in the light of our own reason, all the elements of knowledge or intellectual perception upon which the instinct of the wild duck is based, and all of which, as existing somewhere, he undoubtedly reflects, we shall soon see how varied and extensive these elements of knowledge are. First, there is the knowledge that the cause of the alarm is a carnivorous animal. On this fundamental point no creature is ever deceived. The youngest chick knows a hawk, and the dreadful form fills it with instant terror. Next, there is the knowledge that dogs and other carnivorous quadrupeds have the sense of smell, as an additional element of danger to the creatures on which they prey. Next, there is the knowledge that the dog, not being itself a flying animal, has sense enough not to attempt the pursuit of prey which can avail itself of this sure and easy method of escape. Next, there is the conclusion from all this knowledge, that if the dog is to be induced to chase it, it must be led to suppose that the power of flight has been somehow lost. And then there is the farther conclusion that this can only be done by such an accurate imitation of a disabled bird as shall deceive the enemy into a belief in the possibility of capture. And lastly, there are all the powers of memory, and the qualities of imagination which enable good acting to be performed. All this reasoning and all this knowledge is certainly involved in the action of the bird-mother, just as certainly as reasoning and knowledge of a much profounder kind is involved in the structure or adjustment of the organic machinery by which and through which the action is itself performed."—*Our Dumb Animals.*

Mathematical Agriculture.

The farmer who toils in the fields knows that there is nothing exactly certain in his business. While the ancient promise that seed time and harvest shall never fail is always verified, yet the character of the one and the result of the other very greatly, and are subjected to serious disturbing influences. Droughts, frosts, or floods of rain mar his prospects, prevent the germination of his seed, kill the tender shoot, or shrivel and beat down the promising ears. No one knows better than the farmer that the variable soil, than which nothing presents more inexplicable differences of action upon vegetation, and the successful manuring of which presents so many insolvable problems to him cannot be brought under the influence of the rule or the multiplication table, nor be made amenable to the exact operations of figures. When, therefore, the agriculturist whose fields of labor are in the laboratory, and whose implements are retorts, test tubes, chemical potents, and weights and measures, undertakes to dictate to him exact formulas by which he may produce precisely so many bushels of corn or potatoes, the practical farmer whose bread depends upon the favorable results of what experiments he may undertake and who may go hungry should they fail, looks with doubt and incredulity upon the figures and wisely abstains from committing his fortunes to so doubtful an alternative. Thirty years ago or thereabouts, when Prof. Liebig first developed his mineral theory of fertilizing the soil, farmers were told exactly what they are told to-day by those who are simply following his methods of reasoning upon well known facts. Formulas were then prepared which in no wise differed from the formulas which are now being widely published for the information of farmers. One suspicious feature about these formulas at least is, that they are got up by persons who have these empirical preparations to sell. This fact alone would make it advisable for a farmer to question their value before he spends his money for that which may turn out to be naught. But our chief objection to them is that they promise too much. For instance, the following formulas for fertilizing the crops named, it will be observed, pretend to carry with them a sort of engagement that the respective yields will be certainly produced by the use of these fertilizers. These formulas, which are copied from a pamphlet published by a dealer in the fertilizers, and who, we believe, sells them in the interest of the Professor who prescribes them, are as follows:

To produce 100 bushels of potatoes per acre, without any manure and their natural proportion of tops, more than the natural yield of the land, and in like proportions for other quantities, apply twenty-one pounds of nitrogen, thirty-four pounds actual potash, eleven pounds soluble phosphoric acid, obtained from 400 to 500 pounds crude materials, which are said to cost about $12, as furnished by the agents in Boston.

To produce fifty bushels of shelled corn per acre more than the natural yield, without manure, and in like proportions for other quantities, apply sixty-four pounds nitrogen, seventy-seven pounds actual potash, thirty-one pounds soluble phosphoric acid. Cost of materials already mixed, $25.

One more formula will be sufficient. To produce twenty-five bushels of wheat per acre more than the natural production would be, apply forty-one pounds of nitrogen, twenty-four pounds potash, and twenty pounds phosphoric acid, obtained from 450 to 600 pounds of crude material, costing about $15.

Now, to purchase any of the above with the expectation that the promised crop would be realized, might, and probably would, lead to disappointment. The cost of these materials, even without the freight and cost of labor of applying them, approaches so nearly the value of the crop to be produced by them that the allowance for loss through unforeseen contingencies is very small. The promised crop is to dispose of all the fertilizing matter added to the soil, so that there is no margin given for any possible gain in their use. It is clearly a game in which one side is safe to win and the other side may win if everything is favorable. But, knowing how uncertain are the contingencies which affect the farmer's crop, how is he to be insured that the effect of these will not destroy all that he hoped to realize from the use of the fertilizer? While we do not oppose the use of chemical fertilizers, but rather advocate their use by farmers who understand their nature, at the same time we would warn both this class of farmers, and especially all others, that they will probably be disappointed if they expect, when they purchase the materials for one of these formulas, that they will certainly harvest the promised return. After much personal experience with artificial fertilizers, we have found them to be most uncertain in their action and very delusive to those who build sanguine hopes upon their results.—*N. Y. Times.*

The New York Fish Hatching House.

The house is situated on Spring Creek, about one mile north of Caledonia village. At Caledonia are the large springs from which the creek is formed. The country in the vicinity is level or slightly undulating. The soil consists principally of gravel and is underlaid with limestone rock. The large pond on the north side of the village has a rock bottom in which are several large springs, but the main spring is west of the pond about twenty rods and is entirely surrounded by hard dry ground. Here, from a shallow basin about two acres in extent rushes with great velocity a stream of pure water of about fourteen feet in width and two feet in depth. This flows into the pond and from thence to the creek, but before reaching the hatching house it receives the water of many other large and beautiful springs. At the hatching-house the stream at the present time is about fifty feet in width by three or four in depth. This water never freezes, and varies in temperature but about eight degrees during the winter. In the immediate vicinity of the hatching-house are numerous ponds filled with fish of various sizes and kinds. All the inlets and outlets of those ponds have to be cleaned twice each day to prevent weeds or leaves obstructing the steady flow of water. In the hatching-house are troughs about forty feet in length and fourteen inches in width, through which flows a stream six inches in depth. In these troughs the spawn is placed to hatch, which requires from sixty-five to seventy days. This variation is caused by the temperature of the water as affected by the atmosphere. The minimum temperature of the stream is 41°, in the pond from which the hatching-house is supplied it is 43°.

When first hatched the central part of the body of the fish is enveloped in a sack, which has the appearance of a cucumber seed with a short piece of horse hair for a tail. When hatching freely and the troughs become crowded they are removed and placed in boxes of about three feet

in length by fourteen inches in width and depth, with a fine wire screen for the top and bottom. A box of this size holds ten thousand. These boxes are moored in the stream until the fish are divested of the sack, when they are ready to distribute and ship. The time occupied from hatching until ready to distribute is from forty to forty five days. During the time the boxes are moored in the stream, each box is carefully inspected every morning, and cleaned. This is done by men in boats, and is not a desirable occupation when the thermometer marks at or below zero. At one time there were about two hundred and fifty of these boxes moored in the stream, but, for the past ten days they have been shipping freely, and the number is greatly reduced. The house is calculated to hatch about two millions of salmon-trout, one million of brook trout, a hundred thousand California trout, also white fish and other species. The whole process of fish culture, from beginning to end, requires the strictest attention and care. The uniform success attending this house affirm that the right persons have it in charge. —*Germantown Telegraph.*

Agriculture in Spain.

A correspondent of the *Agricultural Gazette*, writing of the state of agriculture in Andalusia, remarks: The ploughs in use, which work seven or eight at a time, following each other in the same narrow furrow, are of the rudest construction—probably similar to the first instrument of the kind invented a far off, almost pre-historic ages. The implement, which has no mould board, consequently making only a series of drills without turning a single furrow, possesses, moreover, only one handle, which is sometimes held in the right, and sometimes in the left hand, the mules or oxen with which the Andaluz generally ploughs being guided or driven with the other hand. Such is the system of ploughing, while as regards threshing, the grain, having been collected to a convenient spot, is trodden out by horses driven round in a circle four or five abreast—a system still prevalent in certain districts of the south of France. The straw is carefully stacked, being sparingly used to feed the horses and cattle; for green pasture is rarely obtainable save in the winter season. The crops of corn and barley being reaped when they are just about to flower elsewhere, the fields which are uninclosed present a most barren aspect during the scorching summer months. In certain parts of the province of Cadiz there are vast tracts of country with an uniformly flat horizon, and neither a tree nor a house in view, nothing inanimate rising above the level of the soil, on which here and there there are faint traces of scanty stubble, save the parapets of the wells and the stone or brick troughs of the watering places for cattle and horses. In the midst of this plain, a perfect desert in appearance, are groups of brood mares, instinctively standing as closely together as they possibly can, in the hope of getting a little shade from their respective shadows, and with their heads turned the way of the breeze, so as to inhale a little cool air; or else, scattered over some field, one finds a herd of emaciated cattle supposed to be grazing, though the traces of dried stubble are exceedingly few and far between. It is really difficult to say how the cattle subsist. I may add, though, that they frequently do not subsist at all, but simply die of starvation; and during the summer drought it is by no means unusual to see a cow or a heifer drop down dead. When opened, in nine cases out of ten, balls of earth will be found inside the animal's stomach. Strange to say, moreover, I have known of valuable horses turned out in this senseless manner; they have naturally succumbed, and being cut open, their stomachs also have been found to contain earth.

Nature's Grassy Carpet.

After years of devotion to gardening as the most blessed of pastimes for a hard-working citizen, I rejoice in nothing more heartily than in the exquisitely perfect grass-turf I have secured as the reward of unremitting labor. In some points of management I have departed from the rules from time to time laid down in the *Magazine*, but I have nowhere read such admirable treatises on the making and managing of grass-turf, and if my plan of procedure differs from that of our editor it remains to be said, so far as I am concerned, that I should probably never have acquired a single practical notion on the subject except for his frequent eloquent and instructive appeals to us to do our utmost to secure a perfect turf. Having about half an acre of grass and two good mowing machines—a Shanks and a Climax—I seem to begin well, but a fastidious eye and a strong soil combine to make weeds conspicuous. I tried our editor's plan of changing daisies into clover by means of sprinkling of phospho-guano. It is a grand method to put into operation just before you leave home for a month or so, but I don't like it if I am not going away. On a fine day you take a boxful of phospho-guano or Peruvian guano, and when you find a dock or dandelion, or thistle, you powder the guano all over him by means of a trowel, and make him a nice brown color all over. There follows immediately a brown patch, and if the lawn is dotted with these brown patches, its appearance is decidedly objectionable for about a month or so, therefore, if you intend to leave home for a tour, it is a very proper thing to kill the lawn weeds by this process before going away. Four years ago I treated a pretty croquet lawn in this way, and it has become since one of the loveliest bits of turf I have ever seen, for it is nearly all clover, the result I suppose of the guano-dressing, and after two months of hot dry weather, is still quite green—though dark green—and agreeable to the foot. But, I repeat, this process results in disfigurement of the turf for a month or so, in fact, the brown patches do not disappear until heavy rains occur, and then the grasses and clovers take possession, and the difficulty is at an end. I have tried other preparations for the same purpose, but without finding anything better than guano. I find Watson's lawn-sand an effectual killer of weeds, especially of daisies, but it does not promote a good after-growth as guano does, the result, I suppose, of its being destitute of phosphatic fertilizers. Daisy-rakes are ridiculous, and for the complete eradication of daisies there can be no plan, I think, so effectual as guano-sprinkling. But for three years I have constantly practised a method which I will venture to consider my own. I go out every morning from the time pleasant summer weather sets in until the pleasant summer weather is over. I have in one hand a strong clasp knife and in the other a box of salt. For this purpose I buy agricultural salt, which is considerably cheaper than culinary salt. When I find a thistle or dock, or other rank weed, I carefully cut it out, pushing my knife down so as to cut it below the collar. Into the hole I drop a pinch of salt, which kills the root and makes an end of the business. I must own that sometimes this plan results in brown patches, but they are smaller at all events than those caused by the guano system without the knife, and if the work is done with care, the beauty of the turf is not materially lessened. Let any one follow up this system and make an amusement of it, as I have done, and the reward will come in time, especially if carried out on land that really suits grass. If I had a soil on which grass did not thrive, I would be content with any substitute and make no objection to daisies for, after all, they are green. —*Gardener's Magazine.*

A Practical Test for Vinegar.

We have frequently been asked for some simple and practical method of testing the purity and strength of vinegar. Of course, to ascertain just what and how much adulteration is in vinegar, a chemical analysis is necessary, but for obvious reasons this is not obtainable by retailers generally. The most common adulterant, however, is acid, which is added to increase the strength, and to detect this the pickle manufacturers have a simple test that is infallible, and shows the slightest trace of that article. Each pickle manufacturer keeps a small vial of the solution of muriate of barytes, obtainable for a few cents at any drug store. When a sample of vinegar is offered he turns out a wine glass about half full and adds about ten or twelve drops of the muriate of barytes. If the vinegar is pure it will show no change. If it contains acids it will gradually turn to milky hue, according to the quantity of acids in it. To show the nicety of the test we give an instance that lately happened: A farmer brought in a sample of cider vinegar which, as he had made it himself, he knew was absolutely pure. On testing it, it showed a faint milky cloud, indicating that there was acid of some kind in it. Not being able to explain it, he went home and tested each barrel and found it all so. After patient investigation he finally found that he had used water from a cistern supplied from a roof having copper gutters to carry off the water. We also tested, this week, a sample of imported bottle white wine vinegar, bearing a name known all over the world, and this also showed a slight trace of acids, added probably to increase the strength.

To test the strength of vinegar, the simplest way is to find how many grains of bi-cabonate of soda a troy ounce of vinegar will neutralize or dissolve. As retailers do not have scales sufficiently delicate to weigh out small quantities, the best way is to take a sample of vinegar to a druggist and have him weigh out one ounce. Then if the vinegar is said to be 30 grains strength, weigh out 30 grains of bi-carbonate of soda, and if the ounce of vinegar will neutralize the whole of it and take no more, it is 30 grains of strength. The strength of vinegar, therefore, is determined by the number of grains of bi-carbonate of soda a troy ounce will completely neutralize. —*American Grocer.*

Cruelty by Butchers.

It is a common custom with butchers in New England to gather calves and lambs on one forenoon, carry them to their slaughter-houses, and having kept them penned up without food and drink till the next day, then, at the end of twenty or thirty hours, to kill.

An analysis of the above fact is needed to show how truly horrible it is. The animals are young and growing, thus conditioned to feel the pangs of hunger more severely than at a later age. But it is not hunger alone they feel. Thirst, a much more unendurable pain, tortures them at the same time. But the whole evil is not thus stated. Before they are taken from their homes, calves are almost invariably bled. The loss of blood in any animal increases its thirst very greatly. After being bled it is, in the summer time, taken from its cool and shady pen, and in a crowded rack often carried miles, and for hours in the hot sun, to the crowded pen of the slaughter-house, there to be hot and irritated and frightened till its agony of thirst supplies a new horror. In the winter time, its loss of blood renders the poor wretch far more susceptible to cold, and its sufferings in that direction are piteous. But dreadful as all this is, it is not all. The smell of blood and offal causes great distress to all herbivorous animals. In the slaughter-houses this additional misery is inflicted upon the poor wretches. The sad bleatings of pain and terror that go up all night and day from our slaughter-houses in the twenty-four hours preceding the butchering of calves is truly dreadful.

Then the general method of killing sheep, calves and hogs, is a stain upon our civilization. The true way is to strike one well-aimed blow upon the creature's head, ending all sensibility in an instant, and then to take away its blood. Instead of that, the calf or sheep is hauled up alive by its hind legs, right over pools of blood, and its throat cut while in full consciousness. In the butchering of hogs the matter is still worse, because it is not always sure that the knife will hit the right spot. I have seen a hog killed by a practised butcher suffer excruciatingly for many minutes because the knife had not struck the point intended. Had the animal been first deprived of consciousness by a blow, it would have known no pain.—*Cor. Boston Herald.*

Sturgeons in Harness.

Mr. Robert L. Pell, residing near West Park on the Hudson, has made an experiment in utilizing a sturgeon, from which he extracted much entertainment for himself and visitors. Having caught a fine fish of the kind, nine feet long, it occurred to him that it was sufficiently powerful to draw a boat with at least one man. The fish was therefore secured until a leather or rope harness could be attached to his body in a way which prevented its slipping back of the fins. The fish was placed in an artificial lake, about a quarter of a mile long on the grounds of Mr. Pell.

In order to obtain the services of the sturgeon when needed, a pair of rope reins, eighteen feet long, were attached to the harness, and these were fastened to a large cork float, which swam upon the water. A boat five and a half feet long and two and a half wide was then constructed. It could contain but one man, and in that Mr. Pell took his seat, and attached the chain at the bow to the floating cork. The sturgeon soon began to move, and the moment he realized that a further impediment existed to his movements he shot frantically ahead. The boat swayed to and fro, and the spray, dashing furiously from the prow, flew in every direction. Frequently the gunwhale was an inch or two below the water's edge, but such was the rapidity of motion that the water had not time to overflow it. The lake being but seventeen feet deep, and the reins eighteen feet long, there was no possibility of being pulled under the water by the diving of the fish, and the career of the boat was uninterrupted. The sturgeon kept near the sides of the lake, and swam four times around without slacking his pace. He then rose to the surface, rolled on his back, and exposed his white stomach to the sunshine, as if to say, "I have swum long enough, and am not going any further."

Mr. Pell, satisfied with his experience, then detached the boat from the float and landed. The fish soon again disappeared. At each subsequent sail, whether by Mr. Pell or any one else, the fish would rush regularly four four times around the lake and no more. He would then, as at first, regularly roll over on his back and rest.

A neighbor of Mr. Pell caught a large sturgeon, and imitated his experiment in the river. Matters worked well for a few moments, but it suddenly occurred to the sturgeon to dive. This, the river being deep, he could easily do. To the dismay of his owner, under went the cork float, and a violent jerk at the prow of the boat was a warning to jump into the stream. The boat went down and was lost to sight for several minutes. That was the beginning and end of harnessing sturgeon as a river pastime.—*Albany Times.*

A Cheap Window Ventilator.

Professor Kedzie writes as follows to the London *Sanitary Record*. I propose a cheap window ventilator by which the air will enter in two thin layers, with an upward movement by which it will mingle with the warm air of the room so as to prevent sensible currents of cold air. Take two pieces of board a quarter of an inch thick, one inch wide, and as long as the lower bar of the window; three narrow pieces half an inch thick and one and a half inches long, one end being cut with the bevel of the window stool. Nail these pieces across one of the long slats, one at each end and one in the middle, placing the short side of each piece even with the lower edge of the slat. Nail the other slat on the opposite side of these short pieces, bringing the upper edge of the slat even with the square end of the short pieces. This will make a compound bar with half an inch between the slats, and one slat half an inch higher than the other when the whole is turned upon its edge.

Place the whole under the lower window sash, with the higher slat on the outside. The air can then pass under

the outer slat, between the two slats, and enter the room over the top of the inside slat, having an upward motion which will cause it to mingle rapidly with the warm air of the room, and thus prevent any sensible draft. By thus raising the lower sash, a space will be left between the top of the lower sash and the bottom of the upper sash, through which another thin layer of air may enter the room at some distance from the layer at the bottom of the window. The air must also enter with an upward current, causing it to speedily mix with the hot air in the upper portion of the room.

This arrangement is especially adapted to secure safe window ventilation in bedrooms. If properly constructed and inserted, it will never cause sensible currents in the body of a room except when strong winds prevail, when we usually secure enough ventilation by the imperfect construction of our window casings.

Measuring Inaccesible Heights and Distances

A correspondent of the London *Academy* thus describes an ingenious invention of Prof. E. C. Pickering, of our Massachusetts Institute of Technology.—"It is designed for measuring the distances and heights of mountains. It consists of a common telescope, with a level attached, a scale of equal parts in the eyepiece, and with a mirror of plate-glass fastened to the object, so that it can be set at any angle. Two images are seen, one through the glass, and the other by reflection from its surface, and any two objects may be made apparently to coincide by turning the mirror through the proper angle. Selecting as our object the mountain whose distance is to be measured, and as the other any convenient, well defined point, the telescope is moved through a known distance, and the apparent change of position is measured by the scale. From this the distance may be determined with all the accuracy needed by an ordinary map. The altitude is then determined by leveling the telescope and reading the apparent elevation from the graduated scale, which is now turned round. By a second inclined level, higher mountains may be measured. It will probably equal in accuracy a large theodolite, with the advantage that it does not involve a finely graduated circle or delicate mounting. It is therefore inexpensive, light and easily used. It could be carried by any traveller, and would give the height of a mountain much more accurately than a barometer. Further, a whole range of mountains might be measured in a few hours by this instrument, while with the barometer a single ascent often occupies several days.

Hints to Horse Traders.

First, look at the horse while standing still in the stable. If he seems to rest one foot, look that leg from top to bottom. See if he has any splints, spavins, puffs, windgalls, or curbs, or if he is knee-sprung, and if his hip-cap is down, for in fat horses this sometimes hardly shows. Next, his eyes; if they look weak and he is young, it may be caused by what are commonly called "blind teeth." If this is so, his face will be thick, and they can easily be found by looking just in front of the first grinders, and should be pulled with common horse forceps, or punched out. The first is preferable, as you can't get all the roots by punching every time. Next, look at his coupling, and if he kibs up well. By placing your ear to his breast, you can usually ascertain if his wind is good, after a little travelling. Next, see if he stands straight on his feet, or if he stretches himself while standing. It is a great mistake to want to see a horse on the move all the time. You can learn twice as much about a horse standing still as while moving. Far better back a horse than see him go forward; for if stiff, there is where he will show it, and that is what will tell on his shoulders, if they have been hurt at any time. If you wish to buy ride the horse yourself, for the owner knows the gait that his horse moves best in, and you can tell by the motion of the horse, if you are on him, whether there is anything the matter with his travel or not. I could add much more, if I thought necessary.—*Am. Farm Journal.*

Soldering at Home.

In my younger days I learned a trade requiring the nicest use of the soldering-iron, so-called, though the iron is or should be copper. I always do our own soldering of every description, and considerable for the neighbors. A satisfactory soldering-iron will cost (at hardware store) half a dollar or more—one costing much less will not hold heat long enough. To do good work the soldering-iron must be kept well tinned at the point or where it is to come in contact with the work. To tin the iron proceed as follows: Take a brick and hollow one side about the size and shape, but a little deeper than the bowl of a table spoon. Fill this place half full (or more) of pulverized rosin. The "iron" should have four equal faces, tapering gradually to a point. With a middling coarse file brighten the faces of the iron to the point.

Now heat the iron, but *never* let it get red hot. By holding it near your cheek you will soon learn when it is hot enough. When heated, wipe the faces quickly on an old cotton cloth, slightly wet, then with it melt enough tinman's solder to fully fill the bowl of a large teaspoon, letting the solder, as it melts, drop into the cavity of the brick with the rosin. Now plunge the iron into this melted solder and rosin, rubbing it violently back and forth—first in and then out. The brick will keep the face bright till the solder adheres to it. Keep rubbing all four of the sides till each is thoroughly tinned. If any spots of the iron refuse to take the tin, brighten the same with the file while the iron is hot and then rub it in the cavity.

For soldering tinware, it is far better to scrape the tin bright and apply pulverized rosin than to use liquid, but if the tin is worn off, then the liquid must be used. Its use, however, rapidly corrodes the soldering-iron, which will have to be filed again before it can be tinned. Red heat also takes the tinning off. To scrape your work, use an old three-cornered file, ground sharp towards the point. Keep the brick for future use. Always wipe the iron after heating to remove ashes, etc.

To prepare the fluid above mentioned, drop small pieces of zinc into the muriatic acid, one at a time, waiting till each is dissolved, and keep adding till the acid will dissolve no more.—*Rural New Yorker.*

Cold in the Head.

Few unimportant maladies are more disagreeable than a cold in the head, and how to get rid of it is a problem not always easy of practical solution. Some people resort to "sudorifics and lying in bed," others to large and frequent doses of quinine, and others to persistent and resolute dippings of their heads in cold water—the colder the better. But Dr. Ferrier, in a recent number of the *Lancet*, recommends a novel cure, which he has tried with excellent effect in three cases—his own and those of two other persons. The local symptoms of cold in the head—namely, watery eyes, running nose, sneezing and nasal speech—are, as Dr Ferrier says, the chief source of annoyance and discomfort. Local treatment, therefore, seems to him to be the most rational. In the catarrh of alcoholism and in more chronic forms of gastric catarrh bismuth alone, or in combination with morphia, acts almost like a specific. Dr Ferrier came to the conclusion that in nasal catarrh —*i.e.* cold in the head—the same drug by itself or with others would prove efficacious. "On a certain evening recently," Dr Ferrier says, "I began to suffer with the symptoms of cold in the head—irritation of the nostrils, sneezing, watering of the eyes, and commencing flow of the mucous secretion. Having some trisnitrate of bismuth at hand, I took repeated pinches of it in the form of snuff, inhaling it strongly so as to carry it well into the interior of the nostrils. In a short time the tickling in the nostrils and sneezing ceased, and next morning all traces of coryza had completely disappeared." Dr. Ferrier adds:—"The formula which I find on the whole the most suitable combination of the ingredients of the snuff is as follows:—Hydrochlorate of morphia, two grains; acacia powder, two drachms; trisnitrate of bismuth, six drachms. As this is neither an errhine nor a sternutatory, but rather the opposite, it may be termed an anti-errhine or an anti-sternutatory powder. Of this powder one-quarter to one-half may be taken as snuff in the course of the twenty four hours. The inhalations ought to be commenced as soon as the symptoms of coryza begin to show themselves, and should be used frequently at first, so as to keep the interior of the nostrils constantly well coated. Each time the nostrils are cleared, another pinch should be taken. It may be taken in the ordinary manner from between the thumb and forefinger, but a much more efficacious and less wasteful method is to use a small gutter of paper, or "snuff spoon," placing it just within the nostril and snuffing up forcibly so as to carry it well within. Some of the snuff usually finds its way into the pharynx, and acts as a good topical application, if there should be also pharyngeal catarrh. The powder causes scarcely any perceptible sensation. A slight smarting may occur if the mucous membrane is much irritated and inflamed, but it rapidly disappears. After a few snuffs of the powder, a perceptible amelioration of the symptoms ensues, and in the course of a few hours, the powder being inhaled from time to time, all the symptoms have entirely disappeared." This is worth knowing and remembering in the present season of hot sun and cold winds.

Usefulness of Sparrows.

Now that the sparrows are beginning to multiply largely in different parts of this country, and here and there the opinion is expressed that instead of being useful they are very injurious, in fact as bad, or worse, than the worms they are intended to destroy, we again raise our voice in their favor, recalling the time when there was, in the summer season, scarcely a tree in New York, Brooklyn, or Philadelphia which had leaves, and the worms that had eaten them were hanging in bunches by their spider-threads, often attaching themselves to the clothes of the passers-by, and thus creating general disgust. This has all passed away since the practical application of one of the provisions in the economy of nature—that birds living on insects are intended and may be used to check their too large multiplication.

In some countries where matters had become balanced, the number of birds being sufficient to keep down any excessive multiplication of insects, the people not being aware of this natural provision, and only noticing the damage done by the birds on the growing crops, and greatly exaggerating the same, caused an almost total destruction of birds, especially of sparrows; this, among other places, was the case in Italy where rice and other crops suffered somewhat from them. The result of their destruction was such a propagation of destructive worms and other insects as to create general alarm. The naturalists in that country then published the following:

"Get all the sparrows you can procure from neighboring countries, and make as many holes as you can in the walls of your houses and churches; each hole will become the temporary abode of a pair of sparrows, and each pair, to feed its offspring, will have to destroy thousands of insects, which you can not yourself put down. You will raise the objection, that when harvest time comes, your fields will be covered with sparrows and the destruction of grain will be enormous; but this you can very easily avoid. Young sparrows, just before they are able to leave the nest, are a delicious meal. Visit the nests regularly, take all the broods except the last one, which will come after you have stored your crops and will feed on what has escaped your notice; the loss will therefore be scarcely perceptible. This is the only rational solution to the question of sparrows."

This advice was strictly followed, and the destruction of the early broods is still practised in Northern Italy. In France, sparrows are not disturbed, and their mischief is very little felt. As they do not appear to multiply so rapidly in that country as in Italy, there is no necessity to keep them down; nor in this country will that necessity occur, as from the severity of our winters thousands of sparrows perish yearly, which is not the case in Italy with its mild climate.—*Builder.*

Exaggeration about Implement Trials.

Commenting on a tendency among implement manufacturers to grossly exaggerate matters of detail when extolling the merits of their respective machines, the Michigan *Farmer* says of a recent plough trial over the lines: We have some idea of what a plough should do, and if such trials are intended to be of use to the farmer, they must be put in such measures as an ordinary practical farmer can understand. When we are told that the depth of a furrow is seven inches and eleven twenty fourths of an inch; we, in common with every practical man, will have some doubts about the measurement on account of the extreme minuteness of the fractional part of that last inch. When we divide an inch into 24 parts, and claim that a furrow can by any possibility be measured so as to split a quarter of an inch, we begin to think that the measurer has brought a microscope along to enable him to keep tally. In this report the breadth of one furrow is made out to be 15 inches and 23-24ths of an inch. It only lacked one twenty fourth of an inch to be 16 inches wide. When we consider that the horses have to walk very steady, and the plough must be guided as true as a planing machine, not to make the other 24th, through the whole length of the furrow, we will see it must be nice work on the part of the ploughman not to deviate that minute fraction while he is ploughing that particular furrow. Give us measurements, messieurs committeemen, that are within the scope of the ordinary ploughman, and don't fritter away your efforts to bring results that are more nice than wise or useful, and, in which certainly no ordinary man who has any practical knowledge of ploughing can have any faith.

Peculiar Features of Milk.

It is well known that the specific gravity of milk from different cows varies, and this can be readily understood, since there is great variation in the quality of milk yielded by different cows. But a rather singular feature in respect to milk is that recorded by the well known chemist, Mr. J. A. Wanklyn, member of the Royal Bavarian Academy of Sciences. Wishing to note the difference, if any, in the specific gravity of milk drawn from different parts of the bag of the same cow and at the same time, he selected cows in a dairy that were well cared for and fed on meal, clover and other food calculated to give a good quality of milk. The milk was drawn directly into the samples bottles from each quarter of the udder, and on carefully testing them to determine the specific gravity, at a temperature of 60° Fahrenheit, the samples gave the following:—Milk from the right side front quarter exhibited a specific gravity of 1020.4, while the left side front quarter gave milk having a specific gravity of 1021.3. On testing the samples of the milk from the hind quarters of the udder, the right hind quarter gave milk the specific gravity of which was 1023.0, and the left hind quarter 1023.5:

Another sample of milk, the specific gravity of which was taken on the same day it was milked, at 60 Fahrenheit was 1020 4, while two days later the same milk showed a specific gravity of 1030.2. The experimenter says:—"From the whole course of our experiments, it appears that the first change which milk experiences is a contraction Specific gravity 1029 becomes specific gravity 1030. The next change is expansion, and this occupies some days, which is manifested by the specific gravity sometimes falling below 1000.' These experiments show that there are some curious features about milk and that there is ample room yet for investigation.—*Rural New Yorker.*

A Word to Farmers' Boys.

One boy, and perhaps more, living on a farm near a country village, road-crossing, or even in a neighborhood composed entirely of farmers can earn several hundred dollars per year without interfering with his duties on the farm by learning how to grait and by managing a small nursery. It may be all too true that the business of carrying on commercial nurseries is greatly overdone and that there is no longer much money to be made in raising fruit and ornamental trees for the general trade. It may also be true that every portion of the country is regularly canvassed once or twice each year by agents of home and distant nurseries, and by "tree peddlers" acting on their own account. It may even be true that they visit every house and endeavor to sell their wares as persistently as lightning-rod and sewing machine agents endeavor to sell theirs. It may be admitted that the general farming community has become tired of the visits of these gentlemen, and heartily wish that they would discontinue them forever and a day. Many are sick of both the traders and the wares they sell.

But it is nevertheless true that the boy or young man who engages in the nursery business on a small scale with a view of carrying it on in connection with general farming almost always succeeds. It is difficult in almost every portion of the West to find persons who understand grafting. Nearly every farmer has on his place native crab-apple or wild plum trees that he would like to have grafted with better fruit. Many of them have large cherry trees that produce very small cherries that are chiefly composed of "skin and bones." These they would like to have grafted. A person in the neighborhood who understands his business can get very profitable employment during the season in grafting these trees. A preference will always be given to a person in the neighborhood, as he can see to the trees after they are grafted and can put in new scions the following year if any of those set at first fail to grow.

The many misfortunes that most farmers have experienced with the trees they have bought of strangers, and which come from a distance, have taught them that they had better purchase trees of responsible parties who live near their homes Many of the trees they have purchased proved untrue to name when they come to bear, while the great proportion never come into bearing, or, for the matter of that, never come into putting out blossoms or leaves, in consequence of the great length of time they have been out of the ground If the persons who have had this sort of experience plant trees again they will obtain them, if they can, of persons near home, so as to avoid the troubles we have spoken of Most likely they will prefer to have the person who raised them plant them out, and will pay him for his work, presuming that he understands the business better than they do. In this thing they will not be likely to be mistaken.

A person who sets about starting a nursery with a view of supplying local trade need not keep a great variety of either fruit or ornamental trees. He should endeavour to raise the best varieties for his immediate neighborhood, regard being had to the peculiarities of soil and climate. If he limits his varieties in this manner he can conscientiously recommend them as trees that will endure the climate. If he commences in a small way, he will build up a reputation as he is increasing in his business. It will cost him nothing to advertise and nothing to ship his trees and vines. Most persons living in town have no time to set out trees, and many of them do not know how to do it well. They have small places, and they want the best that can be obtained. They will generally pay to have trees set in their gardens for fruit, and will also pay to have trees set on their streets for ornament.

If one has the land and ordinary farming implements it will cost but little to procure an outfit to commence a small nursery. Tools for grafting and for pruning trees cost but a trifle. With the aid of a book like Thomas' Fruit Culturist any person of ordinary ingenuity can learn to graft. The same book gives full directions for planting tree seeds, the laying out and management of a nursery. —*Chicago Times.*

Farmers Tenants.

I have thought it might interest some of your readers to drop a few hints on the landlord and tenant system; or, in other words, renting. There are many whose means consist principally in land, who farm it in whole or in part; and others do not cultivate their lands. Where farms are leased for cultivation, the advantages should be mutual between landlord and tenant; as a general thing the investment of the former is the greatest, the tenant's consisting mainly in implements, horses and cattle. It is pleasing and important to the land-owner to see his land well cultivated, kept clean, well fenced in, and at the same time improved. His tenant is one he knows, or comes to him well recommended, and while things go on satisfactorily, that relationship to each other is likely to remain so. But if the one is too exacting, and the other too remiss, the compact is likely soon to terminate. One thing is very important, honesty; if the tenant undertakes to give a certain portion as rent and fails to do so, and if he does not keep up the fencing, and lets the farm go down, he cannot expect to continue on it. I have seldom known a real good tenant out of a place long; he is respected and sought after; a good tenant, like a punctual borrower, can get good farms on good terms, whilst bad tenants and non-punctual borrowers are at a considerable discount. Lands rent in various ways, either for money or portions of the crops. In some places the half of the crop is required, the landlord furnishing half of the seeds and fertilizers. Two-fifths also are given, and the tenant furnishes the seed and three-fifths of fertilizers. In both cases the ground is to be sowed down in the grasses. There are two things certain: if a tenant wishes to keep a farm, he must be honest, industrious, and an improver. On the other hand a landlord should know when he has the right tenant and make it to his interest to stay. Tenants should be aware that they can get a greater use of land than money on loan. The land is a security itself, whereas a note for money must be well endorsed and met with interest when due.—*Am. Farmer.*

Uses of Horns.

Amongst the causes which tend to the cheap production of any article, and which requires additional capital, may be mentioned the care which is taken to allow no part of the raw produce out of which it is to be formed to be wasted. An attention to this circumstance sometimes causes the union of two trades in one factory, which otherwise would naturally have been separated. An enumeration of the arts to which horn of cattle are applicable, furnishes a striking example of this kind of economy. The tanner who has purchased the hides, separates the horns, and sells them to the makers of combs and lanterns. The horn consists of two parts; an outward horny case, and an inward conical shaped substance, somewhat between hardened hair and bone. The first process consists in separating these two parts, by means of a blow against a block of wood. The horny outside is then cut into three portions by means of a frame-saw. 1st. The lowest of these, next the root of the horn, after undergoing several processes, by which it is rendered flat, is made into combs. 2nd. The middle of the horn, after being flattened by heat, and its transparency improved by oil, is split into thin layers, and forms a substitute for glass in lanterns of the commonest kind. 3rd. The tip of the horns is used by the makers of knife handles and the tops of whips, and similar purposes. 4th. The interior or cone of the horn is boiled down in water. A large quantity of fat rises to the surface, this is put aside and sold to the makers of yellow soap. 5th. The liquid itself is used as a kind of glue, and is purchased by the cloth-dresser for stiffening. 6th. The bony substance which remains behind is ground down and sold to the farmers for manure. Besides these various purposes to which the different parts of the horn are applied, the chippings which arise in comb-making are sold to the farmer for manure at about one shilling per bushel. In the first year after they are spread over the soil, they have comparatively little effect; but during the next four or five, their efficiency is considerable. The shavings which form the refuse of the lantern-makers, are of a much thinner texture. A few of them are cut into various figures, and painted and used as toys, for they curl up when placed in the palm of a warm hand.

Hydrophobia.

As to the period of incubation, or time elapsing between the bite and the symptoms of rabies, it is very various. In fowls it is put down at two days; cats, from two days to four weeks; dogs, three days to ten weeks; sheep and goats, one month; horses, fifteen days to two months; oxen, nine days to one month. It must not be supposed, however, that all danger is over at the end of these periods; for a standing order of the Austrian government is, that in case of an ox bitten by a suspected dog, he must not be slaughtered for human food for four months after. Herbivora, also, are much less easily affected with rabies than the carnivora—almost every dog or cat bitten taking the disease. The herbivora, too, seldom transmit it, for many of them do not bite at all. Their saliva, however, is just as dangerous as that from dogs. The symptoms of rabies in various domestic animals are briefly as follow: Fowls, Dr. Linche of Jena says, are always affected with the dumb variety, lose the power of standing, and die quietly. Pigs become very savage, froth at the mouth, and will bite at anything viciously. Sheep exhibit a very hoarse voice, scrape with their feet, grind their teeth, saliva often running from the mouth. Cattle show very feverish symptoms, attempt to rub the part bitten, and sometimes froth much at the mouth. The horse manifests great excitement at times, in the intervals appearing perfectly quiet. When aroused, he neighs in a broken, hoarse manner, stares wildly and bites viciously. Attempts are made to micturate, and the sexual organs seem much excited. As the disease advances, the muscular twitchings increase, saliva flows, and he may become unable to swallow. Convulsions supervene, sometimes the sufferer tears his own flesh horribly, the fits come on more frequently and with greater violence, the hind-quarters are completely paralyzed, and the animals affected generally perish in a violent fit.

Among the means of prevention proposed, one of the most ingenious is the removal of the front teeth from all dogs when young. The supporters of this plan insist that this would not injure the appearance of the dog; that he could feed at will as ever, and that he would be generally as useful to man, while perfect safety would be insured; for even a mad dog, if he had not the front teeth, could not break the skin of those he attempted to bite. But although the plan was propounded some time ago, it has made no progress in popular favor. The spreading of reliable information regarding this subject, will be likely to accomplish more to abate the evil than anything else.

Fortunately for man, but a small proportion of those bitten by rabid animals become affected—sometimes not more than ten per cent; in no case more than fifty per cent. But in case of being bitten by a suspected dog, the first thing to be done is to thoroughly remove by the knife the bitten part, or, if the laceration be so deep or extensive that it cannot be thus treated, use a liquid escharotic, like strong nitric acid. If this has not been done in the first instance, it is advisable to cut out the part even if it has completely healed over—for many hold that the poison does not immediately circulate through the system, but remains dormant for a certain length of time about the wound. Many persons, when thus bitten, pursue the dog relentlessly until he is killed. This is not wise; he should be secured, if possible, and kept. Very likely he may turn out not to have been mad at all, and in such an event the bitten party is safe, and will be relieved of all farther anxiety.

At a variable period after receiving the bite of a rabid animal—from six weeks to eighteen months—the old cicatrix may show signs of pain, and in a few hours the whole system will be affected, shown by pain of the neck and throat, inability to swallow, and that fatally diagnostic symptom, horror at the sight of water, with dreadful paroxysms of choking. After these symptoms show themselves, the patient seldom survives more than a day or two.

The treatment recommended is only palliative, as the best authorities assert that there is no well-authenticated case of recovery on record. The distressing symptoms,

however, "may be alleviated by the use of chloroform, opiates, the hot-air bath," &c., but which need not be enlarged upon. Only a year ago, Prof Hermann of Prague, fell a victim to this malady, and Dr Lorenzoi, in writing of his case, remarked that hydrophobia was an entirely imaginative disease Were this true, it would be a dreadful thought that anyone could produce such a disease by the power of his imagination It is satisfactory to know that such theorists are wrong Rabies or hydrophobia is as truly a contagious disease as small pox, and, in absence of proof to the contrary, may safely be said to be as impossible of production by the imagination.—*Cor. C. Gentleman.*

Horses Facing Wild Animals.

A slight sketch of the mode of proceeding adopted may be worth notice, showing, as it does, that horses of high courage under proper treatment exhibit a wonderful amount of intelligence, and soon become accustomed to the sight and behavior of the wildest and most terrible of brutes. The first object is to avoid anything like a sudden fright, and to have sufficient time and space at command to enable those engaged in such an undertaking to run no risk of failure. It therefore required many days to practise their introduction to the various wild animals they are hereafter likely to meet in the jungle. It was only early in the morning, and before visitors were admitted, that these experiments could be carried out. It was decided that each horse should be mounted by an experienced and good rider. Mr. Prince, the stud-groom to his Royal Highness, and two grooms selected for the purpose, arrived at the appointed time, and, instead of entering the gardens at once, were slowly riding up to the park fence, on the road known as the Outer Circle, and from this position they could clearly see the large male African elephant walking about in his paddock; *in this way they felt* somewhat safe, as they had the open road before them, and the elephant was behind the fence As soon as the horses had recovered their surprise at the sight of this animal, they were ridden into the gardens, and *brought near enough to* the elephant to make a close inspection of his general appearance. They were a little nervous at first, more especially when the great brute set up his large ears, and made an attempt to rush toward the horses, and utter his shrill note of alarm; they, however, soon began to acquire confidence, and ceased to start or jump from him, and, after a day or two, would allow him, when let out with them, to come close enough to touch the end of his trunk. The next thing was to introduce to their notice the large male Indian rhinoceros However quiet the horses were in-lined to be, this savage monster was extremely angry at the sight of the men on horseback in so close proximity to his abode, and he rushed and snorted about in and around his paddock in a frightful state of excitement, and had it been in his power to get at them, he would, doubtless, have made short work of his new acquaintances. Notwithstanding his fury, Coomassie behaved in the most cool and composed manner. It was most delightful to witness the watchful and intelligent gaze with which this beautiful animal kept his eyes upon the frantic and enraged rhinoceros, without exhibiting any particular fear or alarm; and no doubt this coolness on his part assisted greatly to quiet his two companions, Cockney and Dashwood. It soon became evident that the task would be safely and perfectly accomplished. The camels were soon afterward tried, and these appeared likely, at first, to afford rather more trouble than the elephant and rhinoceros. Their long, shaggy hair, the strange humps, and queer heads and necks, seemed to puzzle the horses considerably; but after a while they allowed them to come near enough to smell them, and gradually acquire more confidence, until they would stand side by side and pass round or between them, touching them with their noses, and becoming quite familiar. It may appear singular, but the horse Coomassie appeared to have a wish to examine and recreate all the animals in the gardens; he required no urging to bring him face to face with the lions and tigers, notwithstanding the excitement into which the sight of the horse caused these animals to fly, but Coomassie looked at them with a most inquiring eye, not appearing in the slightest degree alarmed This, then, ended the training of three of the finest of the Prince's horses *Land and Water*

A Sagacious Cat.

Some twelve years ago, while living as a resident surgeon in the Ballarat Hospital, I had, among other pets, a large black tom-cat, which was a most valuable beast of its kind. We were *much troubled with mice*, and if I knew where a mouse was to be found, behind any old boxes or other litter, I could call my old friend and just say, "Mouse, mouse!" and he would work as well as a terrier would for "Rat, rat!" But this was not his only peculiarity, for he had a strong *penchant* for birds, at the time rather scarce—indeed we had none, except when the swallows, or rather, I believe, martins, were about. These used to build in some holes left in the walls, to allow of ventilation, between the floor of the upper wards and ceiling of the lower ones. Tom found this out, and found out how to catch these birds, although the holes were about *fifteen feet from the ground*. My first discovery of his attainments in this way was made one forenoon when I was engaged in one of the lower wards, and saw Tom come flying down from above, outside one of the windows. I at once exclaimed that some one had flung my cat out of the window, and with my back up as high as his ever was at the terrier, was going to rush upstairs to make it hot for some one, when I was told by my old wardsman that "Tom was only catching birds" This I could not believe and said so. I was quietly advised to go and watch, so went out to see about it.

I met old Tom quietly walking into the back door, and, calling him, found him all right. He followed me upstairs, and on my going to the ward above the one I had just left, he followed me into it, and quietly trotted off to an open window, where he took up his place on the look-out again. I asked the attendant what he was doing there, and was told he was on the look-out for a bird. I began to think there was not any cause for my ire, and went to another adjoining window to see the fun. I had not been there three minutes when away went Tom again, but he had no luck. I found on observing him, that he knew exactly which windows were over a hole with a nest in it, and he would wait for one of these to be opened, when he would take his stand with his head just over the sill-stone, and as soon as he saw a bird fly, he would make a jump, and take his chance of catching his prey during his fall, which could not have been less than 19 feet, as the height of the lower yard was 15. He would repeat this manœuvre frequently during the day, and would catch a bird about once in three jumps. Tom was too great a favourite to be starved, so he did this for mere love of sport, and probably the resultant feed. I don't know what other tricks he might have learned had he lived, but unfortunately he fell a victim to strychnine.—*Eng. L. Stock Journal.*

Pig-killing in New York.

A lot of hogs are first driven up an inclined plane which has cleats nailed to it, to prevent the slipping of the animals' feet, until we get them into a second story pen, close to the operators. A man is supplied with a lot of clamps having a ring on one end, which he dexterously slips upon the hind leg of a hog, hooking the rope of a windlass worked by steam into the ring of the clamp, and in a moment the squealer is dangling in the air, head down. The clamp is attached to a small wheel or truck on a circular railway overhead. As the hogs are pushed round this track, they are seized by the sticker and knifed as they pass him, the blood running down a spout into receptacles to collect it for further use. When first started, a few moments are given the hog in which to die, but after that they are all dead by the time they arrive over the scalding-tub or vat, where the water is heated by steam. When all is ready, the clamp upon the leg is disengaged, and the hog, well bled by hanging head downward, is dropped into the vat, which is large enough to hold from twelve to fifteen hogs. They receive a little attention here, a man with a stick passing the floating bodies to one end where some long iron fingers, or lifter, also worked by steam, receives and lifts them out upon a bench. Here an incision is made under the jaw, a hook with a link attached is inserted in the slit made, and the link held so as to be caught upon a projecting hook of an endless chain passing through the scraping machine—that latest invention to take the place of "scuttlers"—with its candlestick-shaped scrapers. This machine is a cylinder, made of boiler-iron, 5 feet in diameter and 15 feet long, having 225 independent cast-iron scrapers, attached to as many steel springs or arms secured to the sides and nearly meeting in the centre. With so many of these scrapers pressing upon all parts of the hog, as he is drawn up through the cylinder, it is rarely the case that the carcass comes out with any hair save a very little about the snout, lower parts of the legs, and rump. This is quickly removed, as the hog is self-discharged upon an inclined bench, and passed along to those who perform this duty, while others prepare for and insert the gambrel. Another person attaches the rope connected with the windlass, and the naked hog is again suspended for a final scraping or shaving, is washed off by means of a hose, and disembowelled.—*New York Tribune.*

WE WOULD DIRECT attention to the advertisement of the Ontario Agricultural College which appears in another column It will be observed that the Institution is at present on a most satisfactory basis, fully equipped, and working in every department most successfully.

Stock Notes.

MR OUTHWAITE, the celebrated Short-horn breeder of Barnesse, Catterick, England, sustained a heavy loss last month in having to destroy several valuable animals that had been bitten by mad dogs.

ENGLISH CATTLE FOR THE CENTENNIAL EXHIBITION.—George Grant, of Victoria, Ks., has imported a lot of cattle from Her Majesty's farm, at Windsor, England, to exhibit at the Centennial. The cattle arrived on June 9th, at New York, on the steamer Grace from London, and consists of the bull Royal George and seven heifers, Rosa, Countess 2nd, Minnette, Matilda, Cold Cream 10th, Roseleaf and Peeress.

GEN. R. M. GANO, well known throughout Kentucky, has had an adventure. While buffalo-hunting on the Texas frontier, after killing seven fine cows he attacked an old bull. His horse was killed beneath him by the accidental discharge of his revolver, and as the animal fell he was thrown over its head directly toward the infuriated buffalo, who, astonished at the boldness of the charge, turned tail and left the General in possession of the field.

L. P. MUIR of Kentucky, received from Mr. John Thornton, the well known auctioneer of Short-horns in Great Britain, a set of sand-glasses, one running out in 10 seconds, the other two in 13 and 15 seconds respectively. The late Wm. Wetherell's "and the glass runs" in announcing a bid is well remembered. Messrs. Stratford and Thornton invariably use them in conducting sales, and we suppose an effort will be made to introduce them in this country.

UPPERMILL SHORT-HORNS FOR AMERICA.—In addition to a pair of heifers purchased by Mr. Smith, Perth, from Mr. W. S. Marr, Uppermill, for export to America, we understand that Mr. Marr has sold other four animals which also leave this week for the journey across the Atlantic. The purchaser of two cows, a two-year old heifer, and a bull calf, is Mr. Armstrong, of Cranberry Farm, Guelph, Canada, and the price of the four is $2,887. The pair of heifers bought by the Messrs. Smith, cost $1,560. Mr. Marr's herd numbers nearly two hundred animals, many of which are of great merit.

Short-horn Sales.

AT LOCUST LAWN, Illinois, L. Baruss & Son sold 24 females and 16 males, at an average of about $120 for the former, and $110 for the latter. The animals were of comparatively low pedigree. The highest price realized was $475 for Anna Lesley 2nd.

GROVE PARK HERD.—This sale came off on the the 7th ult. at Berlin, Illinois, when 60 head were disposed of at an average of $275. General Curtis added to the catalogue 3 of the Princess tribe, which netted $2,050. The highest price realized for any one animal was $950 for Princess of Oxford 2nd.

MESSRS. LANG & THOMSON'S sale at St. Mary's, Canada, June 17th, did not prove as successful as it deserved. The cattle were a good lot, in fine condition. The largest prices of the day were as follows:

Matchless 17th, and b. c., S. W. Jacobs, West Liberty, Iowa.	$510
Matchless 14th, and c. c., W. J. Beggins, Clinton, Ont	355
Matchless of Kinellar, S W Jacobs	305
Mary 4th, F. McHardy & Co	300
Orange Blossom 20th, A. E. Kimberley, Iowa	900
Village Lass, S. W. Jacobs	675
Bonny Lass 2nd, S. F Rounds, Harrington, Ont	410
Alexandria 6th and b. c., A E. Kimberley	705

Summary.

19 females, average	$324	—Total,	$6,155
2 bulls do.	145	do.	290
21 head, average	$306	—Total,	$6,445

SPRAGUE'S SALE, ILLINOIS.—The public sale of thoroughbred and grade stock announced by L. B. Sprague was held at his residence near Springfield, Ohio. The attendance was very large, probably not less than 400 being present, and the weather very favorable. The following prices were realized:

Short-horns—Cows.

Kitty Burns, Jerry Rea, London, O	$ 30
Pixie, E Shyract, Plattsburg, O	225
Pixie 3rd, red, 4 years, by Don Louanjo 7840, David Selsor, London, O	310
Pixie 5th, C F Roher, Tremont, O	140
Pixie, A J McDorman, Grape Grove, O	80
Lucky, E O Helskitt, S. Charleston, O	140
Yorkshire Ellen, J W Shinn, Springfield	135
Red Rose, J. Rea	100
Crop 2nd, C F. Roher	210
Olympa, J. Rea	150
Olympa 1st, Geo. Watson	170
Olympa 2nd, M. B. Sprague, Springfield, O	150

Bulls.

Horace Man, red, 4 years, Mr Myers	$ 85
A young bull, red, 17 months, by 20th Duke of Airdrie 13572, dam Kitty Burns by Boxer, M. B. Sprague	240

AT THE Short-horn sale of Messrs. A. H. & I B. Day, at Keokuk, June 15th, prices were well maintained, though the number of bidders present was not large. We quote the following leading lots:

Lady Newham 5th, D. M. Flynn, Boone, Iowa	$675
Lady Newham 6th, do do	300
Crimson Rosebud, J H. Lusk, Clay Grove, Iowa	550
Minnie Moore, E. Close, Cedar Valley, Iowa	310

Jennie Napier, Pliny Nicholas	500
Maria Woods 4th, Isaac Bliss, Warsaw, Ill	300
Maria Woods 5th, J. W. Blackwood, Newtown, Iowa	360
Maria Woods 6th, Wm. Piper, Mechanicsville, Iowa	400
Louan of Van Buren, Wilson & Son, West Liberty	1200
Lady Gay 2nd, Wilson & Son	420
Milleta, Wm. Piper	510
Highland Mary 2nd, E. Close	500
Ella, Pliny Nichols, West Liberty, Iowa	300
Loudon's Grace Young, Dr Sprague, Des Moines	700
Loudon's Mary, D. Wilson & Son	405
Dolly Varden, D. M. Flynn	300
Miss Macgregor, Geo Chase & Son, West Liberty	310
Miss Balco, D M Flynn	530
Lucy, C. S Barclay, West Liberty	420
Cherry Knight 6th, J. H. Potts & Son, Jacksonville	455
Imported Golden Drop 1st, Jacobs & Wilson, West Liberty	1000
Golden Drop A, Jacobs & Wilson, West Liberty	1475
Golden Drop B, do. do.	1275

Summary.

45 females, average	$339—Total,	$17,510
5 bulls do	161 do.	805
50 head, average	$337—Total,	$18,315

Correspondence.

MILKING MACHINES.—G. K.—As there seems to be a demand for such machines as you have for sale, you would do well to advertise them in the CANADA FARMER.

PULLING PEARS.—Pear-grower.—Pull your pears a week or ten days before they ripen, or become mellow, and arrange them on shelves covered with cloths—in a dark place

PROLIFIC.—D. N. Kerns, of Pennsylvania, writes:—Out of 200 White-crested Black Poland eggs I got 150 chickens, all as lively as crickets—and asks "Who can beat it?"

PARIS GREEN.—Parmentier, Stratford.—Pure Paris Green is chemically termed Arsenite of Copper. It is a most deadly poison, and, if used at all, should be used with the most scrupulous caution.

COW SUCKING HERSELF.—Reader, Dundas.—If, as you say, the habit is only formed, apply a little tar to the teats, and repeat the application occasionally. This plan has often proved a most effective remedy.

HENS EATING EGGS.—D. D., Woodstock.—Feed them well with other food, and see that they get a proper quantity of lime. If they still persist in eating their eggs, draw their necks and prepare them for table or market.

GOLDEN SWEET CORN.—Farmer, Princeton.—This variety is a hybrid between the Common Yellow or Canada Corn and Darling's Early. It yields well, and is hardy, but in respect to quality it is less sugary than other varieties.

SUBSCRIBER, Oshawa.—The sample you enclose is that of ordinary meadow grass, the commonest kind of it. Its rapid growth was owing to the fact of its having been removed to a warmer temperature, and to the extra care bestowed upon it.

WHITE SPECKS IN CREAM.—Dairyman, Ingersoll.—These arise from too much acid in the cream, and progress by keeping. In time, if not got rid of, they act like reanets, changing all the cream into curd. Remedy: Churn before the acid developes.

KILLING ELDERBERRY BUSHES.—Reader, Washington. Cut them down close to the roots immediately with a grub hoe, and keep removing sprouts, as they appear, in the same manner. Next season the bushes will not trouble you much if this course be adopted.

TEATS WITH TWO APERTURES.—J. W.—In the case you refer to an operation is necessary, which can be performed only by a skilful veterinary surgeon. The teats must be slit open, downwards, from the spurious apertures to the points, and then be allowed to heal up again.

BLACK-CRESTED WHITE POLANDS.—Fancier, Galt.—Yes. Such a variety did once exist, but unfortunately the strain is thought to be lost. The last seen appears to to have been found by Mr. Brent at St. Omer, in 1854. If the breed is now in existence at all, it must be either in France or Ireland.

TIGHT OR OPEN BARNS.—Subscriber, Perth.—Make your barn walls tight by all means. The wide-boarded, wide-cracked barns of our childhood were professedly intended to admit air and perfect the curing of hay, but they really caused the destruction of a large fraction of the crops, by admitting moisture as well as air—the united influences of which bleached every particle exposed.

Miscellaneous.

FOREST PLANTING is thriving in Minnesota. The St. Paul and Pacific Railroad has set out four millions of young trees, and altogether it is estimated that twenty millions have been planted on the prairie lands.

AN EASY WAY TO DRIVE SCREWS into hard wood is to file a flat about one-fourth of an inch long on the side of the screw, beginning at the point. This cuts the wood and forms a thread in the same way that a tap does. The screw follows and holds well.

COL. MOORE, we regret to see announced in the last *Rural New Yorker*, so long the able and unflinching editor of that journal and advocate of the farming interests of the country, has been obliged by failing health to withdraw from its farther conduct and to seek relief in a milder clime.

A CAT CLOCK.—Hue in his "Chinese Empire" says that the Chinese tell the hour of noon by the eyes of the cat. The *pupils* of their eyes grow constantly narrower until twelve o'clock, when they become like a fine line, as thin as a hair, drawn perpendicularly across the eye; after twelve the dilatation recommences.

A POLISHING POWDER.—An intimate mixture of one part of Paris rouge (oxide of iron) with six parts of carbonate of magnesia is one of the best polishing powders, not only for silver, but for iron, steel, copper or gold. It is best used with a piece of rag dipped in a little water or alcohol, and then rubbed until nearly dry, when the object is cleaned with soft leather.

HARDENING TOOLS.—Mr. W. Oldfield in a communication to the *English Mechanic*, says: "Mercury is the best liquid for hardening steel-cutting tools. The best steel, when forged into shape and hardened in mercury, will cut almost anything. I have seen articles made from ordinary steel, which have been hardened and tempered to a deep straw color, turned with comparative ease with cutting tools, of good tool steel hardened in mercury."

MILKING THE WRONG COW.—An industrious citizen of San Juan, Cal., arose a few mornings ago, when the festive lark was still soaring, and with a tin bucket under his arm went to the barn to milk the cow. It was dark and rainy, and in fumbling about for old brindle, he got into the wrong pew—the off mule of his wagon team. He can't remember now at which side of the roof he went out but his recollection of lighting on the picket fence is very vivid. He expects the bucket down in a few days.—[Ex.

"SARAWAK" calls our attention to some typographical errors in his last letters. In the article "Crops, country stores, &c.," the words *what* and *it* should be inserted to convey the proper meaning in the following sentence, thus: The seed was good and came up well, but *what* with &c.,—I gave *it* up for lost." In the article "Fruit and other notes" Seckel, as the best, should read the "*least* adapted to this part of the country." "Rostique" should read "Rostieger," and the sentence "Here I am inclined &c.." should be "Here, were I inclined to indulge in fine writing."

REMOVING STUMPS.—Among other means employed in the removal of stumps, comes the suggestion to use sheet iron chimneys. These are cone-shaped below, in order to cover the stumps, extend into a tall stovepipe above, and are raised upon short iron legs, in order to furnish a draft from beneath. Kindling material is piled around the stump, the chimney is placed over all, and fire applied. The chimney acts as a blower, and with a good draught the stump is soon consumed. A few of these chimneys of different sizes, will clear a field of of stumps at a very small expense of time and labor.

NEW FISH.—A fish seemingly of a new species was recently caught below Smith Creek Bridge. In general appearance it resembled a pickerel, but the fins were entirely different, it having two fins growing from the gill covers, besides the usual shoulder fins. On the back was a ridge of long strong spines, resembling those of a bass or perch. The other fins were larger in proportion also than is usually found in pickerel. Some of our sportsmen thought it to be a cross between a pickerel and a perch, or black bass. Others thought it was a young maskinonge, which is probably correct.—*Paris Star.*

INSTINCT OF TURTLES.—Audubon, the naturalist, states that at certain places on the coast of Florida, sea turtles, those huge, stolid-looking reptiles on which aldermen are fed at the expense of tax-payers, possess an extraordinary faculty of finding places. Working their way up out of the reach of tide-water with their flippers, quite a deep hole is excavated, in which a batch of eggs are deposited, and then carefully covered up. On reaching the water they frequently swim three hundred miles out to sea, foraging for appropriate food. When another batch of eggs are developed after a lapse of about fourteen days, they will return unerringly in a direct line, even in the darkest night, and visit the buried eggs. Removing the sand, more are deposited and secured. Away they go again as before. They know instinctively the day and hour when the young brood, incubated by the solar rays, will break the shell, and are promptly at the spot to liberate them from their prison. As soon as fairly out of the hole, the mother turtle leads them down the bank to the waves, and there ends her parental solicitude and maternal duties.

EXPERIMENTS RECENTLY made in England indicate that waggons are most easily drawn, on all kinds of roads, when the fore and hind wheels are of the same size, and the pole lies lower than the axle.

EFFECT OF MUSIC ON A PIGEON.—Bingley gives a singular anecdote of the effect of music on a pigeon, as related by John Lockman, in some reflections concerning operas, prefixed to his musical drama of Rosalinda. He was staying at a friend's house, whose daughter was a fine performer on the harpsichord, and observed a pigeon which, whenever the young lady played the song of "Sperisi," in Handel's opera of Admetus would descend from an adjacent dove-house to the room window where she sat, and listen to it apparently with the most pleasing emotions; and when the song was finished it always returned immediately to the dove-house.

KEEPING DRIED FRUIT.—A housekeeper, writing of the best methods of keeping dried fruit says: "I have kept pared peaches for four or five years, by keeping them in the dark. As soon as removed from the dry house or bake oven they are put into any kind of strong bags, tied tight, then placed in a close box, chest o· barrel. If a barrel is used, it must be carefully lined with paper. The only secret is in keeping fruit (like furs) in the dark. The moths will find access in time to bags or jars, if exposed to the light. The old plan of re-heating dried fruit makes it dark in color, and causes it to lose its pleasant flavor. Another says, on the same head: "When dried, I place a common vegetable steamer over a kettle of boiling water; if the holes in the bottom let the berries or corn through, put a thin cloth over them, then put in corn, &c, to the depth of two inches, stirring often with the hand, so that it may all heat alike. When it gets too hot for the hand, I conclude the larvæ are destroyed, then I put it into a pan and dry thoroughly, and put into stone crocks, tieing a strong cloth tight over the mouth of the crock. I fill a fruit can for handy use, as often as required. I have several kinds of berries on hand that have been dried four years, and corn two years, treated in this way, and there never has been a worm in any of it."

NEW USE FOR PAPER.—The Americans have discovered a new use for paper. It is one which certainly would not suggest itself at first sight. They employ it as a substitute for wood. Paper has for years done duty as linen, but perhaps except when employed by bookbinders we should not expect to find it taking the place of 'boards.' American growers had found that wine long stored in the wood suffered from the contact. It was certainly a bold idea to abolish wooden casks and wrap wine in paper. But it is announced to have been done. And the new fabric is said to have proved so successful that it is to be applied to general purposes of storage. It is made by some peculiar process, the principal material employed being rye or barley straw. Of course it is waterproof, so that no portion of the wine is absorbed, nor can such a cask become charged with the gases which are set at liberty in course of fermentation. It was a doubtful point whether it could resist the force to which it would be subjected during fermentation, but as one sample was proved to have withstood a strain of 4,000 lbs., that question may be treated as settled. It is no small part of the advantage of the new casks that they can be packed so as to occupy much less space. They are made in a cylindrical form, and it is calculated that this gives an advantage in stowage amounting to 15 per cent.

A SHEEP FOND OF PRACTICAL JOKES.—The following story is sent by an esteemed correspondent, and the unusual incidents related are well authenticated: The Provost of a certain town in Scotland possessed a pet lamb, which in course of time had developed into a large sheep. In the eyes of his master this animal could do no wrong, but to his fellow townsmen it was a serious nuisance, principally from its persistent repetition of the following practical joke: The Provost's house was approached by what in Scotland is called "a pend"—that is an entry with buildings above it—the building in this instance being a granary with a window immediately above the entry. Every day the sheep ascended the stair to the granary, and took his stand at this open window. Concealed and silent, he bided his time, until some hapless visitor to his master drew near the entry. The doomed man, suspecting no danger, leisurely stepped on the threshold, when instantaneously he was felled to the earth by the sheep dropping on his shoulders as he passed. Long before he could gather himself up, the sheep had run up the granary stairs, and resumed his watch for another victim. The Provost was besieged with complaints against his pet—more than one fat bailie representing that his life had been endangered by the fall and the fright. The Provost turned a deaf ear to their complaints, and either denied the facts or defended the playful disposition of his favorite: and as he was the richest and most important person in the town, his fellow-citizens were compelled to submit, and the sheep enjoyed his joke unmolested. The day of retribution, however, was at hand. A county election came on, in which the Provost played a prominent part, and one day when he was escorting two fine gentlemen into his house, bowing and flourishing and making as he thought a fine figure, plump came the sheep on his shoulders, and laid him prostrate in the mud. What befell the sheep, history sayeth not, but from that day forth the inhabitants of that town were permitted to call on their Provost in safety.—*The Animal World.*

BEE SCAVENGERS.—A mouse found its way into the hive of one of our amateur bee men, not long since, and the intruder was found dead, and completely imbedded in wax. The mouse, having a sweet tooth, crept into the hive to steel honey, but unfortunately aroused the inmates, and before he could find his way out again, he was stung to death. By-and-by decomposition set in, and Mr. Mousey began to disseminate a bad smell, which bees cannot tolerate; but finding it impossible to hustle him over the ramparts as they do other nuisances, they went energetically to work and sealed him up in wax, hermetically sealed him, in fact, so that not the slightest odor escaped, to make the hive unpleasant for the high-toned, extremely neat and cleanly inhabitants.—*Schoharie Republican.*

IRON IN WHEAT.—M. Gasparin has made an analysis, which amounts almost to a discovery. Boussingault and Fresenius have each drawn attention to the absence of iron in wheat. Gasparin has found, after several minute tests. 20½ per cent. of iron in the grain of wheat, and 1¾ per cent. in the straw; and that while the phosphoric acid, magnesia and iron concentrated themselves in the grain, the silica and the lime accumulated in the straw. The same relative accumulation of salts were observed respectively in the kernel and the shell of oak glands. In every pound of wheaten bread there is then 1½ grains of iron. M. Gasparin also states that the quantity of phosphoric acid extracted by wheat from the soil is less than is generally supposed The same distinguished chemist analyzed some lichens, grown on calcareous rocks, and found their ashes to be precisely composed of the same minerals as soil derived from the disintegration of the rock.

FISH AT THE CENTENNIAL.—The Centennial Commission has provided thirty aquaria for the display of the fish of our rivers, lakes, and seas. The fresh and salt water will be of about equal quantities, the aggregate approximating to fifteen thousand gallons. Full preparations have been made for filtration and aeration, and, when necessary, for refrigeration. The expenses attendant upon the fish display will be assumed by the Centennial Commission, and it is expected that fish will be contributed by the various State fish commissions, by associations, and by individuals interested in fish culture. Parties so desiring may exhibit fish in tanks of their own contribution, the care of which will be gratuitously assumed by the Commission. In addition to the display of living fish, will be exhibited the processes of hatching fish, and a full series of all the apparatus used in hatching and transporting roe and young fish.

Those who are in a position to contribute rare fish to the display, will receive all necessary information by addressing Mr. Landreth, care U. S. Centennial Commission, Philadelphia, Pa.

A CHAMELEON'S TOILET.—Young Tiffany's chameleon shed its skin this morning. When my attention was first called to it, I thought it was an imposture, for the little reptile looked just as if it had on a little night gown of fine lavender colored muslin, tied or tucked in at the neck and top of the tail. This strange garment gradually parted in opening. While this process was going on, the chameleon, which was on the floor, and had a thread tied around it, held at one end by Willie Tiffany, would very unexpectedly and suddenly make vigorous little rushes and darts across the floor, to the length of its string and to the great discomfiture of the ladies, who were gathered around it, watching the shedding process. On such occasions the ladies would run screaming to a corner of the room. The suddenness and rapidity of the small varmint's movements whenever he started seemed to deprive them of all presence of mind. The chameleon got hold of what he could of the cast off garment and tried to swallow it. Upon examining segments of this cast off skin under a magnifying glass, it was seen to be full of perfectly circular holes, arranged in the most regular and orderly manner, and the texture resembled that of the crown of a bonnet, though not quite so close.—*Hartford Times.*

A CHEAP REFRIGERATOR.—A correspondent of the *Country Gentleman* thus describes a cheap refrigerator: "It is about the size of and resembles, on the outside, an ordinary tool chest; within there are pieces of wood fastened on for supports, and a lining of zinc put in—the space between the zinc and the wood being filled with pounded charcoal. This filling must be all around, in the cover as well as in the bottom and sides. In the ends of the box, cleats of zinc are soldered on, and the shelves of perforated zinc, or wire, or of wooden slats, are slipped in. For a rack to put the ice on, take four slats about four inches long, and nail them firmly to a little block of plank, set this block down (like an inverted kitchen table) in a basin, and put it in the middle space in the box, between the rows of shelves. To make a piece of ice do the greatest amount of service, and last the longest possible time, wrap it closely in several thicknesses of flannel and lay it on the rack. A square tank holding a pail or two of water can be made of tin or zinc and fitted close up to the inside, with a pipe leading through the box, near the bottom, and a faucet attached. If this is kept filled with cold spring or well water, and a lump of ice thrown in occasionally, it will be found a desirable convenience in hot weather. After the box is finished it should be painted and set where the cover, when lifted up, can rest back upon a brace or frame, as it is heavy and would easily break from the hinges. A cellar is a good place for the ice box, but it may be kept in the pantry, store room or wood shed, as is most convenient."

TRAVELING THRESHERS.—A writer in an exchange says the greatest evil to which farmers are exposed by patronizing traveling threshers, is the carrying of foul seeds from one farm to another. If one farmer raises red root or Canada thistle, the seeds are sure to be carried all through the neighborhood by these threshers and clover hullers. The remedy suggested is, for good tidy farmers to club together and buy a thresher—not the large six or eight horse-powers, but a good tread power as now made, with a level tread, that will thresh two hundred bushels a day, with one team and three men. "It is far safer," he says, "more profitable, because less expensive, costing not more than one-half, some say not more than one-third as much per bushel to thresh grain as with the traveling machines, and it relieves the house of a small army of men. As long as traveling machines are used from farm to farm, they should be brushed and swept from top so bottom before moving from each station. This is the only precaution that can be taken to guard against the dissemination of foul seeds, except the plan above suggested."

Patrons of Husbandry.

The following new Granges have been constituted since last issue:

511 MORRIS CENTRE. Sam'l Love, Master, Brussels, Wm. Michie, Secretary, Brussels

512 PROTON.—Robert Kinnell, Master, Dromore, J. Campbell, jr., Secretary, Hopeville.

513 CHESLEY.—A. D. McDonald, Master, Chesley; Wm. Cannon, Secretary, Chesley.

514 WEST BROME.—C. C. Shufelt, Master, Brome, Carner, Quebec; James C. Pettes, Secretary, West Brome.

515 PROSPECT HILL.—Allan Flack, Master, Cremore; Wm. Millie, Secretary, Cremore.

516 WARKWARTH.—Thos. B. Carlow, Master, Warkwarth; D. Ewing Secretary, Dartford

517 WINGHAM.—Peter Deans, Master, Wingham; R. A. Graham, Secretary, Wingham.

518 BIG BAY POINT.—S. L. Soules, Master, Barrie; Wm. Metcalfe, Secretary, Painswick.

519 SOUTH MONAGHAN.—Wm. Adams, Master, Bensfort; James Wood, Secretary, Bensfort.

520 MORNING STAR.—Thos. Johnston, Master, Peterborough, Wm. Girvin, Secretary, Peterborough.

521 HILTON.—C. S. Becker, Master, Hilton; S. R. Thorne, Secretary, Hilton.

Division Grange.

WELLINGTON No. 30.—John McGowan, Master, Alma; Robert Cromar, Secretary, Salem.

Catalogues, &c., Received.

The "Pacific Guano Company" of Boston issues an interesting pamphlet on the history of guano and its relation to agriculture.

Prof. Beal publishes a small work on carnivorous plants, inequilateral leaves, and the venation of a few odd leaves.

The Eighth Annual Report on the noxious and beneficial insects of Missouri, prepared by Professor Riley, contains a large amount of valuable information.

Vol. 15 of the "American Shorthorn Herd Book" is to hand. It is a large, comprehensive work of 960 pages, beautifully illustrated, and as nearly complete in every respect as a work of the kind can well be made. It registers 3621 bulls, bringing the consecutive number down to 25,480; and 5,600 cows.

The American Berkshire Record, vol. 1, is a neat volume of 340 pages, well printed and bound. It is edited by Mr. A. M. Garland, and published by the American Berkshire Association, Sprinfield, Ill. The work is a valuable one as being the first successful attempt to complete a record of this important branch of live stock.

CONTENTS OF THIS NUMBER.