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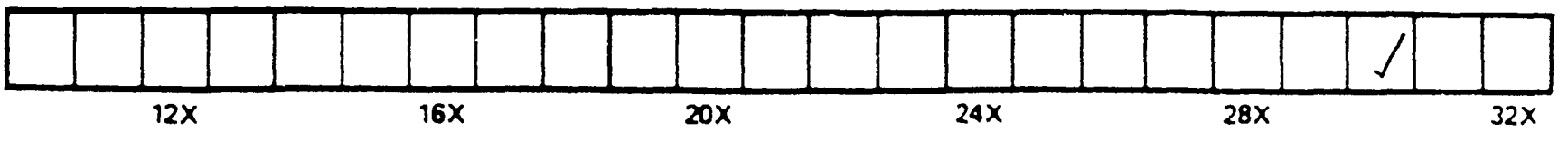

THE CANADA FARMER

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The Field.

Tillage Experiments.

The U. S. Departmental Report of the Commissioner of Agriculture for 1870 contains, among other useful and interesting matters, a record of recent farm experiments. It is not by any means a crowded record, and seeing that it embraces British as well as American Agriculture, one is impressed with the idea that careful experimenting is not being carried on very extensively, either in the old world or the new. The record is too long for transference bodily to these columns, and part of it relates to cotton culture, and other matters not suited to our latitude; we therefore cull and condense those portions likely to be of interest and use to our readers. The first item that seems deserving of notice relates to

Wheat Culture.

An Alabama farmer gives an account of an experiment tried by him on two acres of land, which had been several years in cultivation, but was in such poor condition that it was not capable of producing more than seven or eight bushels of wheat per acre without manure. In the latter part of Nov., 1869, the land was ploughed thus:—"A furrow was opened to the depth of about four inches with a turning plough which was followed by a subsoil plough, running nearly eight inches deep; and the field was then cross-ploughed with scooters, and laid off with a small scooter in furrows ten to twelve inches apart, leaving the surface in small ridges" Dec. 3, he sowed broadcast 1¼ bush. Clayton wheat, 30 bush. cotton seed, and 140 lbs. Peruvian guano per acre, and dragged the ground level and smooth with a good, home-made brush. The wheat grew beautifully, ripening the latter part of May, and standing five and and a half feet high. Sixty-four bushels of excellent wheat were harvested from the two acres, and 11 to 16 bushels lost by lodging, ravages of birds, &c. The profit of the crop, after paying all expenses, was $47.47½ per acre. It must be stated that the wheat brought $2 per bushel. At a much lower figure than that, however, the crop would have been remunerative, to say nothing of the improved condition of the land.

A Georgia farmer reports an experiment with fertilizers on an acre of exhausted land which, during 1869, had produced, with the aid of manure, 17 bushels of corn. Late in October the land was ploughed. Six two-horse loads of well-rotted stable manure were then spread on it. This was turned under by cross-ploughing with the same plough. 250 lbs. of dissolved bone were then scattered over the piece of ground and harrowed in. 120 lbs. of wheat were then sown on the plot, and covered with a heavy brush. In February, when the wheat was about six inches high, 250 lbs. ammoniated phosphate were applied. In the latter part of March, when the wheat was in the boot, 125 lbs. of ammoniated dissolved bone and 25 lbs. of salt were put on, the application being made on the dew in the morning, and repeated, in the same amount and manner, one week afterwards. The crop obtained measured nearly 57 bushels. No estimate was made of the value of the stable manure, but the cost of the artificial fertilizers used was $27.55.

Leaving the "sunny South" and coming to Vermont, we find a farmer trying the effect of superphosphate on wheat. In October he ploughed to the depth of ten inches, a pasture containing about 2½ acres, the soil being a brown loam of uniform quality. The next year he planted potatoes, dressing the land with 200 lbs. of plaster. In the ensuing spring he divided the land into three equal plots of 146 rods each. Plot 1 was sown with club wheat, wet with brine, and dried with Bradley's superphosphate. After harrowing once, a dressing of this fertilizer was applied, the rate per acre, including what was used in drying the seed, being 1,939 lbs., and the ground was then harrowed thoroughly and rolled. Plots 2 and 3 were fertilized and treated in a similar manner with artificial manures of other brands. It is not necessary to give all the details. The salient point of this experiment is that it did not pay as it regards the immediate crop, which was thirty-two bushels to the acre. The fertilizer cost $67.87 per acre, and the product at the high price of $2.26 per bushel, the average price in Vermont that season, would amount to $71 87, only $4 over the outlay for the fertilizer, and leaving too small a margin for the labor, to say nothing of profit, which is, after all, that which brings the livelihood.

Next we may just glance at some

English Experiments with Wheat and Barley.

These are taken from the Journal of the Royal Agricultural Society, and relate to drilling grain in rows of extraordinary distances—eighteen inches apart. Out of a number of experiments with wheat, all, except one, went to show that, contrary to expectation at the outset, the yield of the extra-spaced drills fell short of that of ordinary spaces, the widely-spaced rows averaging 29 bushels to the acre, and the others 32. In one instance, where the land was of "superior productiveness," and "well prepared for wheat," the result went in favor of the wide spaces by an excess of from seven to eight bushels. Another point included in these trials of wide spaces, had reference to methods of cultivation between them Twenty-seven inch spaces were tried with a row of potatoes between two rows of wheat and barley The result showed the impropriety of deep cultivation between rows of these grains at an advanced period of the season. The experiments with barley were decidedly favorable to wide spacing and deep interculture, the ears being of superior size, and a larger weight of grain obtained. Not only was a larger crop realized, but less seed was used, and greater facility had in working the soil among the growing grain. Along with these experiments, trials were also made in the application of superphosphate and nitrate of soda, which appeared to indicate that the artificial fertilizer was rendered more effective by the concurrent action of the chemical, But the lands on which these experiments were conducted, would grow from 25 to 35 bushels of wheat to the acre without the superphosphate and soda, and the increased yield was estimated at from 6 to 9½ bushels to the acre, with a margin of profit over cost of application. A Canadian farmer, able to count on from 25 to 35 bushels per acre from his land, would be very apt to "let well alone," and not bother himself with either phosphates or nitrates.

Indian Corn.

Some extraordinary yields of corn are stated to have resulted from experiments which may be expressed in the two words—*heavy manuring*. Indian corn is a gross feeder. It is hardly possible to make land too rich for its ravenous appetite. Four acres grown in Pennsylvania averaged 127½ bushels of shelled corn to the acre, the height of the stalks varying from 13 to 16 feet The manure used on this field was not only abundant in quantity, but concentrated as to quality, having been carefully kept and composted under cover. Another experiment secured 105 bushels of shelled corn to the acre. Success attributed to fall ploughing, thorough pulverization of soil in spring, manure in which was preserved the liquid excrement of the animal, the application of this manure to the surface of the soil, and the use of a bone and ash mixture in the hill. By adding irrigation between the rows to high culture and liberal manuring, a Southern cultivator succeeded in raising, on two acres, an average of 147 bushels per acre, while on a single acre, the enormous crop of 200⅜ bushels were obtained. These crops competed for premiums, and the results were attested by a viewing committee. Several experiments proved Coe's superphosphate to be a most efficacious fertilizer for corn.

Potatoes.

The experience of a New Hampshire farmer with this crop is worth recording, from the inexpensive character of the fertilizing application he employed, viz., "a compost prepared by mixing four bushels of leached ashes with one peck of lime, slaked with a saturated solution of salt, and one peck of gypsum." The compost was applied in the hill. A ridge of dry land ploughed late in the fall, and thoroughly harrowed in the spring, was what was operated on. Rows were laid out three and a half feet apart by running a small plough lightly, and the hills were marked a little more than two feet apart, and planted with potatoes cut to one or two eyes in a piece, two pieces in each hill. The quantity of compost applied to each hill is not stated. As to the product, 230 bushels were got from 1¼ acre of land, and the net profit over all expenses was $34.55 or $27.64 per acre.

Mangolds.

A series of experiments with this root is given. They were "on light land in good condition," and consisted in the application of guano, superphosphate rotted dung, bone dust, &c., in various combinations and quantities. By these means, from two to nine tons of additional yield per acre were obtained.

Mixed Crops.

It will do sometimes to sow a crop of mixed grains where the product is to be fed. Thus to sow oats and barley on lands well-fitted for those grains, especially for barley, is to get more in value than if either grain had been sown alone. More, there will be as many bushels of the mixed crop as if oats only had been grown. At least, this is our experience, and we have also seen it tested in quite a number of cases. It will be said that the oats will ripen later than the barley. This is very true but it is not an objection, as the crop may be cut when the oats have just changed from the milk to the dough, or when the stalk is yet comparatively green. The barley then is fully ripe, giving the oat (the week later) a full chance to perfect itself. The barley then is not riper than we generally see it harvested. There will be an unusually thick growth—like a winrow—and

loose, open, so that the air readily circulates through, and soon fits it for the barn. This is a good crop to feed. It will do for horses and cattle, indeed all kinds of stock—less good perhaps for swine, save store hogs. The growth here is somewhat interesting. At once and all along till up to maturity there is a uniform, fine appearance, the grain seems thicker, occupying the ground densely and completely. It is seen there is a heavy crop growing. When the barley heads out, the field seems to be all barley, a good yield. In a week or two a change takes place. The barley disappears and a green immature look possesses the field. It now has an unfavorable appearance. But in a short time there is an oat crop. Not a barley head is to be seen; all is oats now, and a heavy crop, as the barley was heavy before. This convinces you of what is coming. Seeding has caught well with such crops.

But barley and peas may be sown with almost equal advantage. These ripen simultaneously, the barley sustaining the weak haulm of the pea. This is the main point for which barley is sown with peas—to uphold the crop. The same is the case with oats, which are still stronger than the barley, but later. This, however is not a serious objection. The peas thoroughly ripe, as they should be, will not be too early for the oat, which may be cut comparatively green. It used to be our practice to grow oats with our peas, about three quarts of peas to one of oats by measure when sown, the oats would "stool out," have a large stem, and seemed in the end all a field of oats. Among it, somewhat down but not on the ground, are the peas, all of uniform ripening, "dead ripened," hard and rattling in the pod. This crop must be cut when it is moist, in the morning is the time, or after a rain. If not it will shell the peas badly. Such a crop prepares the land well for a succeeding crop, though not so well as peas alone. It adds to the soil nitrogenous matter, and mellows the ground. In using this crop, some of the oats may be separated by a fanning-mill, the peas fed to hogs in the fall or winter. For this purpose, being heating, they are equal to corn. There are some crops that want to be grown by themselves like wheat and rye, potatoes roots, &c., and of course for general culture, the others also. It is only under some circumstances and for some purposes that crops are mixed to advantage.—*Utica Herald.*

Buckwheat.

Many farmers entertain the opinion that buckwheat is a very exhausting crop. Such is not the case, for it is a well-known fact that buckwheat has has been raised on land for thirty years consecutively without manures or fertilizers of any kind, other than the straw upon which the crop grew, returned to the soil, and after such a long-continued growth of buckwheat, the land produced with proper cultivation good crops of wheat, corn, and clover. Buckwheat would be one of the most valuable crops on thin land, if cultivated in a rotation with other crops, and treated with a due portion of manure; but it is considered a mean crop, and other pet crops of much less profit and value get all the manure and good attention.

I dare say more hog and cow feed can be obtained from thin, poor land by raising a crop of buckwheat than from any other grain, that is by fair culture. As much as sixty bushels are known to have been raised from a single peck of seed sown, and on land that would not yield ten bushels of wheat to the acre, or twenty of corn. Buckwheat should be sown very thin on rich land, almost as thin as corn is planted It is a crop that will branch out very much, the stalks growing in imitation of young trees, the lateral branches producing more abundantly than if sown thick, and the crop grown on top of the stalks. The buckwheat plant is the readiest and cheapest vegetable known to plough under green as a fertilizer and pulverizer of rough land; and it stands unrivalled for subduing noxious weeds, when sown successively for several crops. Timothy seed will make a successful growth among buckwheat if the seed be rolled early in the morning while the earth is damp with dew If the many farmers who feel a predjudice against buckwheat on account of the reputation of its making the land poor, would give the crop a fair trial with other farm crops in regular rotation, they would find it a great advantage in the way of having a plentiful supply of nutritious food, well adapted to the fattening of swine and other stock.—*Newspaper in the Philadelphia Telegraph.*

Decayed Turnips as Manure.

A valued correspondent, furnishes us with some interesting facts relative to growing turnips as manures for grain. It so happened that the owner of the piece of turnips in question was from home at the time the first snow fell, and for some time afterwards, consequently there was no opportunity of harvesting the crop, and it was left in the ground, and as a matter of course all rotted on the land. The following spring oats were sown on the same piece, which contained exactly three-quarters of an acre. At harvest the straw was so heavy the crop could not be cradled, and had to be reaped. After threshing the quantity was carefully measured, and the yield of good clean oats was found to be exactly *seventy-six bushels*, or at the rate of a trifle over *one hundred bushels an acre*. This remarkable crop was again tested by re-measuring the oats, and as further proof, also re-measuring the land. The next year the same piece of land was sown with spring wheat, and again the value of the decayed turnips was verified, by a large crop of wheat being obtained; there being nearly twenty-seven bushels from three-quarters of an acre. For three following years the continued benefit of the decayed turnips was very apparent. The sort sown was the ordinary white variety, and the land was not manured, nor was the crop remarkably heavy; as the turnips were not sown until July, and never hoed or thinned out, the seed was sown broadcast, and very thin, to avoid expense in subsequent cultivations. As we have many times before recommended: the land was harrowed at intervals of about three weeks, commencing the middle of April. This mode of cultivation attacks the weeds when quite young and unable to withstand the constant stirring of the soil Consequently, at the time the seed was sown, all weed seed had vegetated and were destroyed, and hoeing was unnecessary except to thin the plants, which, in this instance, was not done.

EFFECTS OF SOIL ON CROP.—A farmer and his son when visiting this farm, admired the Tartarian Black Oats, then nearly ready for harvest, and requested to have a quantity for seeding their two farms, distant from each other a few miles in this county. The report, when we next saw them, was in one case a splendid crop as to quality, and about 10 qr. per acre: in the other, a very inferior quality, and only 5 qr. per acre—the farming in both cases good, but the land in one case heavy, and with the inferior crop light. They said that they were astonished, and, but for having divided the quantity between them, should have supposed that they could not have been from the same quality of the seed. The season was dry and hot. We usually buy light Fen Oats, which become black and heavy on our stiff soil. We find these produce a better quality than our own heavier seed. — *J. J. Mechi in Gardeners' Chronicle and Agricultural Gazette.*

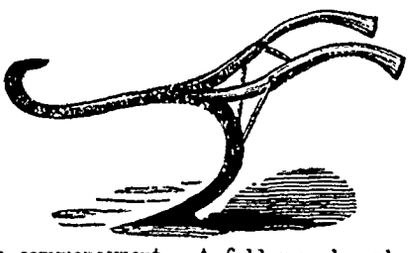
HOP GROWING IN ENGLAND.—Whether the next government return will bring up the acreage to 65,000 it is impossible to say, but any one who journeys in hopland and observes carefully as he proceeds along the road, must come to the conclusion that extra planting is the order of the day. It may be that £6 per cwt., with 10 cwt. to the acre, is very tempting, or it may be that, with an increased consumption of beer, the farmers naturally look out for an increased growth of hops Whatever is the cause, it is gratifying to chronicle, with an increased acreage, there is also increased care in farming, and we are exceedingly glad to record that a slovenly garden is this season the exception not the rule. The present position of the vine is better than might reasonably have been expected and it appears, despite unequalness and thinness in some places, both healthy and clean.—*Brewer's Journal.*

Mr Shaw, an English settler in St. Louis, has presented a park to the inhabitants of that town. It is a richly wooded and picturesque domain, situated close to the city, covering 300 acres, and worth £100,000.

Implements of Husbandry.

A Simple Subsoiler.

While I am on implements adapted for the use of small farmers, I may refer to a very cheap subsoiler which has recently come under my notice. It is very primitive, certainly, but it is just what would suit small holdings, being very inexpensive. I give a cut of this implement, which could be made by any rustic blacksmith at a very small cost. It is made of $\frac{1}{2} \times 2\frac{1}{2}$ inch bar iron, with a simple shovel-share, 6" inches broad. The handles are fastened with screw-bolts to the beam and braced. The uses for such an implement are many. One horse can draw it when a depth of 5 or 6 inches only is taken, which is sufficient



for a commencement. A field may be subsoiled wholly by taking furrows 1 foot apart, and 2 acres a day may be gone over. If run in the rows in which corn, potatoes, turnips, or beans are to be planted and across in the check rows, great benefit will be derived. Used constantly in these ways, the farm will soon be completely gone over, and the soil loosened to a depth of 12 or 15 inches. In a few years this loosened subsoil will become mellowed, and may gradually be brought to the top and mixed with the surface soil.—*London Gent's Magazine.*

The Mower.

There is, perhaps, no branch of agricultural mechanism which has advanced more rapidly within the past half century than the department of mowing and reaping machines.

From the old reaping-hook or sickle—the monotonous and back-breaking horror of poor females—to the more manly and sweeping scythe, was deemed a great stride in advance.

But it remained for the genius of the past few years, and pre-eminently that of this country, to develop and mature what may indeed be considered one of the mechanical wonders of the age—the mower—which so utterly eclipses all predecessors of its department, alike in its labor-saving qualities and in the perfection of its work, and which is by all odds the most profitable implement on the farm. It is in fact a profit in all respects, not merely from the fact of its work being better in quality and greater in quantity than that of any ten men in the same time, but also from the more important consideration that, owing to its ready and speedy adaptability, no ripening grain crop may now, as formerly, be allowed to suffer from the pressing necessities of the hay-crop.

The mowing or shearing part of a present-day mower consists of a serrated blade, made by rivetting a series of triangular-shaped steel blades tightly and smoothly on an iron slide. The sickle thus formed passes through narrow slits in each of a series of fingers or guards, corresponding in number to the knife sections, the whole constituting the cutter-bar of the machine, as shown to the right in the above engraving.

When the machine is used, the motion of the wheels on which it moves is multiplied by means of cog-wheels imparting rapid vibrations endwise to the sickle, and thus shearing off the grass smoothly as it advances through the meadow—just like a number of scissors in exceedingly quick motion.

The finger-bar, that in which the blade vibrates, was invented as far back as 1822, by Henry Ogle, of Alnwick, England, and his machine was, after much experimenting, put into successful operation by T. & J. Brown, of the same place. But so strong was the prejudice of the working classes at that time against labor-saving machinery, that they threatened to kill the manufacturers if they persevered, and so the enterprise was for a season abandoned, only to be

taken up again, however, with increased zeal, and improved until it has reached its present state of perfection.

The cut which heads this article represents the machine complete and ready for work with two horses.

They are also made for one horse, and their width of cut or swarth varies, according to taste, from three and a-half to 5 feet.

Various contrivances are adopted for lifting or folding the cutter bar when the machine is not in operation, or in passing thro' a gate from one field to another, one of the neatest and most convenient forms of which is to fold the oar over in front of the driver's feet, as illustrated in our second engraving.

Another important point of difference in certain machines is that the knife cuts behind instead of in front of the driver. We do not regard this as an improvement, but rather prefer the front cutter for two special reasons, viz.:—

1st. The driver has the work constantly under his eye, whereas in the other case he can only glance at it occasionally by looking over his shoulder; and

2ndly. In case of accident, should the driver be thrown off his seat, he falls behind the knife—a most important consideration, we think.

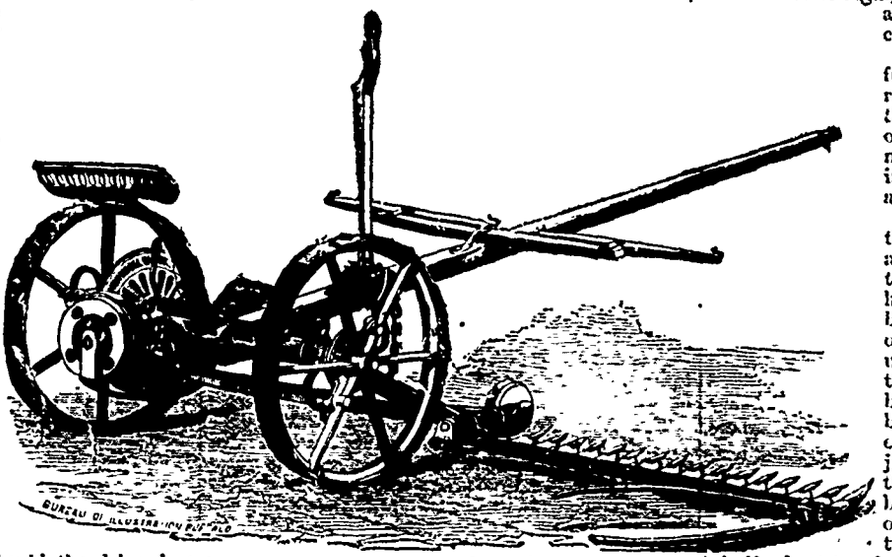
These constitute what may be termed the leading points of difference between the various machines now manufactured. In all other respects the principles are the same, variety being met with only amongst the details.

Where such is the fact, of course any attempt to individualize would seem invidious and needless.

Nearly all the machines now made on this continent are good, and give satisfaction. Indeed, as far back as 1866, at a public trial at Auburn, New York, the report states that out of twenty different mowing machines which were tried on a rough meadow, every one, with two exceptions, "did good work, which would be acceptable to any farmer, and the appearance of the whole meadow, after it had been raked over, was vastly better than the average hand-mowing of the best farmers in the State." And since that trial a continued improvement in manufacture has been taking place.

In recommending every farmer then, whose land is at all suitable, to have a machine by all means, we will conclude by offering a few suggestions as to the points he should always observe in making a selection. These are—

1st. Simplicity of construction. Get a simple machine: it will last longer and not be so apt to get out of order.



2nd. See that the best material (wood and metal) has been used for the knives and other parts.

3rd. See that the gearing is nicely fitted and finished, and that it runs freely.

4th Purchase such a machine as experience has proved to be durable.

5th. Get a machine of light draught, without going to an extreme in this direction, as the draught may be made too light at the expense of something more important.

6th Be particular that the sickle cuts against a steel face in the guards, and that the pitman or connecting rod is as nearly as possible in line with the sickle.

7th. Beware of side draught. You can detect it at once by the tendency of the tongue-point to sway towards the heavier side. The tongue should always occupy a central line between the horses.

8th. Observe the quality of work and the ease of management, and see that the driver's position is safe and convenient.

9th. Mark how the machine adapts itself to uneven surfaces.

10th. Don't seek a too highly speeded machine This feature is highly objectionable in some, jarring and shaking them quite unnecessarily.

Some of these points can be fully determined only by a thorough trial, and it is always therefore safest to purchase only of those manufacturers whose machines have been long enough in use to establish their character in these respects.

A recent improvement, or rather an invention claimed to be an improvement, and applicable to reapers as well as mowers, is known by the name of the "Dubois Attachment." It consists of a small iron shoe fitted to the under side, and on a level with the top of the cutter bar. A balance of ½-inch iron is bolted both to this shoe point and the end of the cutter bar. It projects first forwards for about three and a half feet, then backwards, rising at an angle of 50 degrees, and finally turns toward the body of the machine. A knife about two feet long is placed upon this point near the ground, and rises with the same angle. The bar first mentioned also projects behind the cutter bar two feet or so, still curving towards the body of the machine, and then is fastened directly to the cutter bar by a bolt. The effects of this attachment are said to be important. The front knife cuts a clear way for the shoe, and the bars are so adjusted as to lay the grass or grain quite evenly behind the machine, the latter with the heads away from the standing grain.

A BULLFROG BAROMETER.—A hotel on the Boston road to Melrose, keeps an ordinary bullfrog in a glass jar, half filled with water. Inside the jar is a diminutive ladder, from the bottom of the vessel to the top. Just above the water line is a perch, on which his frogship in dry weather is to be seen sitting perfectly motionless as long as the dry season lasts. On the slightest indication of a change in the atmosphere, the frog quits his perch and takes to the water, returning to the landing only at long intervals to feed upon the flies that are thrown into the jar.

Grasses and Forage Crops.

The Culture of Rape.

We have received a very sensible circular issued by a Wisconsin man to his brother farmers, the object of which is to call attention to the cultivation of rape, and as we have been meditating an article on this very subject for some time past, it may not be amiss to introduce the matter to the readers of the CANADA FARMER, by giving the pith of the circular in question. The leading points dwelt on, are the following:—Much painful experience has taught farmers that growing wheat year after year on the same land quickly impoverishes it Hence the necessity for a change of crops, and if possible, the culture of products that will have a tendency to enrich rather than exhaust the soil. Stock-raising, dairying, growing leaf-crops, such as clover, fodder-corn, peas, &c., which by covering the ground in midsummer with a thick shadow of weeds, increase the fertility of the soil, are of this character. All localities are not adapted to stock-raising and dairying, but leaf-crops may be grown everywhere. One of these crops, viz., rape, has not received the attention it deserves. The reason for this may be partly found in ignorance of the plant, its method of cultivation, and uses, and partly in the idea that the soil and climate of this country are not suited to it. Several years' trial in the town of New Holstein, Calumet Co, Wis., where many thousands of bushels of rape-seed are now raised every season, have proved the suitability of the climate and soil. The price of the seed has remained steady at from two dollars to two dollars and a half per bushel, and the average yield per acre has varied from ten to eighteen bushels; at times reaching from twenty to twenty-five bushels. The production, so far, has fallen short of the demand, It is a product which does not impoverish the soil while it leaves it in excellent condition as to mellowness and cleanliness. The time for sowing is from the middle to the end of June. This gives the farmer time to prepare his land after the rest of the seeding is done. The harvest falls from the beginning to the end of September, a time when all the other harvesting is finished. It may be cut with cradle or reaper, when it is raked into bundles but not bound. After ten or twelve days it can be threshed, either in a barn or on a floor made of boards in the field. It may be trodden out by oxen or horses, or threshed with a flail. It is cleaned in an ordinary fanning-mill. To be sure of a good crop, put on 100 to 150 lbs. of plaster to the acre. The plaster can be sowed with the seed and dragged in. A piece of land producing rape one year will certainly yield the following year from five to eight bushels more of wheat per acre than it will after any other kind of grain. Two quarts of seed are sufficient for an acre.

So far the circular. It relates to the cultivation of this plant for its seed which is ground for the sake of the oil it contains, the refuse being used both as a cattle-food, and as a manure. But there is reason to think that this crop is better worth cultivating as a food for cattle and sheep in its green state, than it is for the seed, even though the near proximity of oil mills created a good and steady market for it. Stephens, in his *Book of the Farm*, says, that in Britain rape "has been cultivated for the fattening of sheep in winter from time immemorial," and that "the green leaves as food for sheep, are scarcely surpassed by any other vegetable in so far as respects its nutritive properties." He adds, "its haulm may be used as hay with nearly as much avidity as cut straw." Cuthbert W. Johnson in his British Husbandry, says:—"On soils which are too adhesive for the growth of turnips, this plant is very frequently cultivated for the purpose of affording food for sheep, and perhaps there is no other on which they fatten with equal rapidity, provided the soil be of sufficient luxuriance to give full vigor to the plant. It may indeed be grown for this purpose with advantage upon every description of land as an occasional crop, particularly upon pasture land when broken up, and it is found valuable upon the best turnip soils, as a change, to prevent the too frequent repetition of turnips. This we find, in the report recently published, of 'Farming at Wauldby, upon the Wolds, in the East Riding of Yorkshire.' "A portion of the fallowed lands have for the last few years been sown with rape solely for the use of the sheep. It is cultivated in drills twelve inches apart, but not thinned in the rows, though well hoed between them. The quantity of seed used is 4 lbs. per acre. To afford a regular succession of food, it is sown at three different periods, between the middle of May and the end of June, and the sheep are put upon it three months after it has been sown. A considerable quantity of the very best food is thus raised, to come in at a period when it is most wanted, viz., when the freshness of the clover and grass keys is on the decline, and before the turnips are fully grown. It is considered equally valuable for the lambs when taken from the ewes, and for the shearing wether sheep, eighteen months old, which are at that period nearly fat, and require food of the most nutritious quality The land is afterwards sown with wheat, and the crop is usually considerably heavier than it is after turnips, or after any other preparation of wold land for wheat."

The *New England Farmer* says:—"Mr. Levi Bartlett, of Warner, New Hampshire, has cultivated this plant for six seasons, and his testimony is "that as yet I have found no green crop equal to rape for feeding milch cows in August and September." Mr. Bartlett narrates an experiment he tried, which although not exclusively with rape, was confined to the family of which this plant is a member, and there is reason to believe that the results would have been very much the same had rape alone been experimented with He says—"Early in June, I manured a smooth piece of green-sward, turned it over flat, and rolled it, then harrowed to a fine tilth, and sowed with a great variety of turnip, cabbage, and cauliflower seeds, as also a portion of the land with rape seed All the different varieties came up well, and grew finely, none of them suffering injury from fly, lice, worm, bug, or "other creature" throughout the whole season. In July, commenced thinning out the plants, and fed them to my cows, morning and evening, till the plants averaged not far from two feet apart each way. This brought it up to sixty-five days from the time the land was ploughed. In order to ascertain the amount per acre at that time, I cut at the surface of the ground, every other plant on two square rods, being a fair average of the plot of ground. The lightest plant weighed three pounds four ounces, and the heaviest nine and a quarter pounds, the whole number averaging a little over five and a half pounds per plant. There were fifty-six plants per square rod; but to be sure of not overstating, I will call it fifty plants per square rod which gives just twenty-two tons, (of 2000 lbs. per ton) per acre of the choicest kind of green food for milch cows, in less than sixty-five days from the time the ground was ploughed. Mr Blackie, in his essay on the 'Improvement of Small Farms,' says, that the produce of rape when well manured, is beyond any thing almost that can be imagined, if let stand until it gets into blossom. Manure, he adds, "makes the stalk tender and juicy, which would otherwise be hard and dry. So that if cut into small pieces for the purpose of feeding green to cattle, not a bit will be lost, and it grows to a height of six feet. I am "he says" almost afraid to say, that I believe, with the addition of some straw, an acre will keep 30 head of cattle in full milk for a month."

We are inclined to think that rape is grown to but a very limited extent in Canada, or indeed any where on the American continent. On looking over a ten years' fyle of the *American Agriculturist*, we find but one article relating to this plant, and that has reference to its cultivation for oil. The U. S. Agricultural Report for 1870, has a few paragraphs on rape, but these also bear on its yielding oil. In our acquaintance among the farmers of this country, we know but three or four who regularly grow this crop. Mr. F. W. Stone of Moreton Lodge Farm, Guelph, makes considerable use of it, and one of the most successful wheat-growing farmers in Ontario, invariably feeds off a green crop of rape, by hurdling sheep on it, as a preparation for fall wheat. In the present state of Canadian agriculture, there is nothing so much needed, as an era of stock raising, a large complument of animals to every farm, being sustained largely by green forage and root crops. Our lands, many of them exhausted by excessive grain-growing, would soon recuperate marvellously under such a system, and farming, by consequence, become a much better paying business.

Rape strongly resembles both the turnip and the cabbage, but it lacks the root of the one and the head of the other, producing an abundant growth of stalk and leaf, and flourishing most luxuriantly in rich soil. It is a light feeder, so far as the land is concerned, and draws largely for nourishment on the fertilizing gases afloat in the atmosphere. It is an exhaustive crop, only when allowed to perfect its seed. Its culture is very like that of the turnip. Like the turnip, it will not come to much in foul land, but once fairly ahead of weeds, it smothers down all growth but its own, in the most effectual manner. It is often sown broadcast at the rate of about three quarts of seed per acre, and then left to its fate, without horse-hoeing or hand-weeding. But it is better to sow with the drill, and cultivate between the rows. Less seed will suffice, two quarts being an ample quantity. The crop acquires greater vigor when sown in drills, cultivated and hoed after the manner of first-class turnip culture. Thus grown, the destruction of weeds and cleaning of the land may be made complete, while the crop of rape is proportionately greater.

It may be added, as a final recommendation of rape culture, that this plant is valuable for its yield of honey. It supplies a beautiful golden honey, of good flavor, and what is of great importance to Canadian bee-keepers, it comes into blossom when almost all other flowers are out of season. Sown the middle or end of June, it blooms from the middle of August until the beginning of September, a time when there is no other honey harvest, except in those localities where buckwheat is grown.

English Turnip Culture.—Water Drill.

Of late years the water drill has been employed with great advantage for sowing turnip seed. The mode of working these drills is far less difficult than would generally be conceived. Upon our high land farms we have either open ponds, or pumps supplied by unfailing springs, where ample supplies of water can be procured, and whence it can be carried in a water-cart.—Where water is procured from ditches which surround the field, the method is very simple. —A large tub is placed at the side of the ditch, just where the drill turns out at the end; this tub is kept filled with water, the drill draws up by the side of it, and the men at once, with pails, fill the cistern.

Not only does the water thus sown in the drills (mixed with the artificial manure) along with the seed moisten the seed bed and hasten the brairding of the crop, but it is the best possible means of conveying the food of the young plants to the soil. A cistern full of water, which is about 60 gallons, will sow 40 chains, which will give a total of about 220 gallons per acre. Several tons of turnips per acre have been almost invariably produced by the water drill over any other method of sowing.

I have just arrived in this country, and have had considerable experience in the raising of roots in England. Light soils, or soils that can be worked smooth are most suited for the purpose. The land must be ploughed a good depth, two or three times before sowing—the last time just previous to sowing, to prevent weeds, and always well harrowed after ploughing, to gain a light and fine surface. Open out in ridges 22 to 24 inches in width—24 inches if the land be subject to weeds—then spread in any kind of farm manure, if clean; but in no case use *new*, or manure that is heating. Most English farmers have their manure one year on hand, and in almost every case use artificial manures along with it, and one-third of the turnips are grown with artificial manure alone. Peruvian guano or bone manure are the best if genuine; Cover in the manure well, leaving the land in ridges; drill your seed on the ridges from one-half to an inch in depth, and always sow every night or before the sun rises the following morning, the land you have prepared in the course of the day, as by so doing you will not lose moisture, and turnips will come up much sooner. One pound of seed is sufficient per acre. In England, flies cause farmers much trouble in droughty seasons, and it therefore requires much more seed—say from three to four pounds per acre. When the turnips are well up, have them scuffled to prevent weeds, and soon as large enough have them thinned by hand or hoe, leaving the plants 10 to 15 inches apart—15 inches if your land is in good condition, and scuffling once or twice after this will prevent weeds from growing, save manual labor and keep the land in good condition. In England, swede turnips are sown from the middle of May to the beginning of June; they then commence sowing the soft turnips.—*Cultivator and Country Gentleman.*

Agricultural Chemistry.

Absorption of Plant-Food.

Plants absorb nourishment by means of their roots. There are some exceedingly important and interesting points connected with the absorption of their food by plants which deserve attentive consideration. It was formerly thought that the roots of plants had minute open mouths or pores through which they could suck up water and other portions of their food, but this has been long known not to be the case. The roots of a seedling plant are composed of cells with very thin and delicate walls through which liquid will readily pass into the interior of the cell, and thence to every part of the plant by a repetition of the same process. Until lately it was generally supposed that the absorption of fluid took place only, or chiefly, at the end of the root by means of certain organs called *spongiole*, which were supposed to exist at the extremities of the rootlets, that is the branches into which the root divides. These spongioles were supposed to be a kind of bulbous expansion of the tips of the roots resembling, as the name implies, little sponges, whose office was to suck up moisture from the ground, just as a sponge would under similar circumstances This idea has been shewn to be altogether without foundation. On the contrary, the tips of the roots are covered by a sort of cap of hardened, condensed tissue, which enables them to push their way through the soil without injury, but through which no absorption takes place. The cells composing it are filled with air, and do not contain fluid. The principle absorption goes on just behind the tips, in which part of the root the growth is most vigorous, and consequently the tissue is the newest and the most delicate. As the cells that compose the root walls become older, they become harder and firmer, and admit fluid to pass through them less readily. Many roots are covered with innumerable minute exceedingly delicate hairs, through which absorption takes place very readily, and which increases the absorbing surface of the root enormously.

The quantity of roots which each plant possesses is usually far greater than is usually supposed, for they ramify in the soil to such an extent, and the finer rootlets are so delicate that when the plant is pulled up by the roots a very large proportion of them are invariably broken off or left behind. The extent of roots can best be ascertained by digging down for several feet into the ground near where the plants are growing so as to make a pit, and then washing away the earth from the walls of this pit by a stream of water. When the soil is washed away by this means from the wall of a pit dug in a field of wheat, the roots of the wheat are exposed in the form of a thick mat of white fibres extending to the depth of from three to four feet, or even more. The fibres of winter wheat have been observed as deep as seven feet in a light subsoil.

The roots of rye, peas, beans and other similar agricultural plants present, when thus treated, a similar appearance. It has been calculated that the total length of the roots of a single oat plant exceeds 150 feet.

All the absorbing portions of these roots, and especially those parts covered with hair, are in very intimate contact with the soil which forms a kind of envelope to them and comes away with them when they are pulled up out of the ground. If we pull up a plant of grass, we shall see that while the older portions of the roots come up comparatively clean, the younger portions and the rootlets attached to them, in which, as we have said, absorption goes on to the greatest extent, are closely surrounded by a covering consisting of small particles of soil, which closely invests them like a sheath. This is a most important fact to remember, and one which has a most important bearing on the question as to the manner in which the food of the plants is absorbed by the roots. It is from the soil that the plants obtain their food, and in the soil many of the substances which make up this food exist in solid state. These have to be dissolved before they are taken up by the plant. Plants will grow in *water containing the elements of plant food in solution*, and will thrive in such a solution, if properly prepared, as well as in their native soil. An experiment shows this clearly. If a grain of Indian corn is placed in cotton wool and fitted by this means into a slit in the cork of a wide-mouthed bottle nearly filled with pure water, it will germinate and begin to develop a plantlet. When the little plant has exhausted all the nourishment that was stored up for it in the seed, it will begin to wither and will shortly die *if the water is pure*. If, however, when the first green leaves of the plant begin to show themselves, a solution of the various ingredients of plant-food, in the proper proportions, is substituted for the pure water, the plant will continue to grow and thrive and may become, if suitably treated, a large and well developed field plant. The solution should contain lime, potash, magnesia, phosphoric acid, sulphuric acid, nitric acid, chlorine and a trace of iron. *Well water*, which always contains some and frequently all of these substances, will often suffice alone. Some water plants, such as duck-weed, must obtain their nourishment in this way; and it has been supposed that all plants are nourished in the same way. The rain is supposed to dissolve the constituents of plant-food out of the soil, and then permeating the ground as moisture, to bathe the roots of the plants and give up to them its dissolved nutritive matter, just as the solution used in water-culture does to the plants whose roots are immersed in it.

One would fancy that if this were the way in which the plants obtained their food, that the more water there was in the soil the better would the plants thrive, but this is by no means the case. An unusual quantity of stagnant water about the roots of ordinary plants produces a most injurious effect. The good effects that so commonly follow from draining show this to be the case The analysis of drainage water also, seems to show that it cannot be from this that plants obtain their food, for the reason that there is not enough of nutritive matter dissolved in such water to support an ordinary crop. The quantity of potash and phosphoric acid, for instance, usually found in water that was drained through the soil, is very minute. In experiments quoted by Liebig, it was shown that the rain water that in six months trickled through 10¾ square feet of soil six inches deep without vegetation, contained eight grains of potash. The water that trickled through the same depth of a similar area, on which barley was growing, contained 6 7 grains, or 1 3 grains less than the first. The barley grown on this area contained 34 grains of potash, only 1·3 grains of which could have been obtained from the drainage water. Indeed if the whole quantity of potash had been taken from the water, it would not have supplied a quarter of the potash in the barley. It is clear that this must have been dissolved in some other way Indeed the soil has an affinity for the salts dissolved in water, and will remove them for solution, so that water that has been in contact with soil, is poorer in dissolved matters than it was at first.

The solution appears to take place in contact with the roots of the plants. We have seen that these roots are surrounded by an envelope of earthly particles. Moisture is drawn up by capillary attraction between the root and the soil, and here the plant-food is dissolved and transferred to the root cells, not by the water that is diffused loosely through the soil, but by that that is in immediate contact with the tender roots of the plants. No doubt the water inside the cells of the root takes part in the process, and causes the solution of the food constituents as when a soluble substance is laid on a bladder which covers a vessel quite full of water it is dissolved by the water in the pores of the bladder, and is gradually drawn into the vessel.

Plants then do not as rule require their roots to be inserted in a soil saturated with water. They require a soil containing a sufficient quantity to moisten their roots, while at the same time the air has free access to every part of the soil.

Farming as it might be.

It is a well known fact that the farm products of this country are not, in any large proportion, what may be called the first-class, and that they do not command a high price in market. Vast quantities of fruit are annually sold at ruinous prices because the quality is so poor. The same *is* true of all farm products. Far from being an exception to this rule the hay crop is a striking example of the immense and needless loss caused simply and only by the carelessness and neglect of its producers. Compared with the amount of hay cut there is but little which is really of first quality. There is a great deal that is very good and a great deal more that is miserably poor. Probably a third-rate article would stand first in point of quantity produced, a fourth-rate next, then a second grade, and last and least of all, what would rank as strictly first-class in point of quality. Now this ought not to be so, and it need not be so. It is in the power of every man who raises this crop to obtain at least a *good quality* of hay. If his land is suitable for it there is little trouble in obtaining the best of hay. If his land is not naturally fitted for grass there are not two ways in either of which he may succeed in obtaining good results. The first and, as far as present results are concerned, the easiest way is for him to obtain the seed of some of the varieties of grass which, while making first-rate hay, are also adapted to his land. For instance his land may be wet and cold, filled with bog or sedge grass of miserable quality. Now if the owner will turn over the turf and let it rot (meanwhile obtaining a crop of corn, oats, or some other grain) and then seed down with Alsike clover, red top or even fowl meadow grass he will not only greatly improve the quality of his hay but also increase the quantity Even timothy can be sown on wet land and for a few years produce good crops. The tendency is, of course, for the old wild grass to supplant the improved kinds, although the clover, being natural for wet lands, is said to hold its own a great while even in cold and poor land. If this course is pursued it is probable that the process will have to be repeated every four or five years in order to maintain a first-rate quality of hay. This system, as we said above, is the easiest, and as far as present results are concerned, without any regard to future comfort or profit, the most profitable method to be pursued But if the farmer looks to the future, as all men ought, and endeavor to provide not only for the present but also to prepare for the future, he will naturally desire some method of improvement which shall be successful in its present results and also be of permanent value to himself and to his farm. This method is found in a system of thorough drainage and high manuring. Is it objected that these things are too expensive? Remember that everything of value is expensive. It costs to improve it but the improvement is a perpetual benefit. Every year it pays something towards the expense. Suppose a case. A farmer has a meadow containing ten acres of good land with the exception of being cold and wet. Because it is wet it is cold and because it is wet and cold both, it will produce only a very inferior quality of hay. It is not suitable for other crops. All that he does with the land is to mow it once a year. He obtains about a ton of hay per acre and when well cured it is worth about fourteen dollars. The land he calls worth about fifty dollars per acre. Now let him dig large ditches to take off the surplus water, let him expend in this way two hundred dollars on the lot.

The dirt thrown out of the ditches will be worth at least fifty dollars—probably more—to put into the barnyard for compost. This will leave one hundred and fifty dollars as the cost of the improvement of the ten acres. The land will now be in condition to bear grass or any hoed crop and will be worth one hundred dollars per acre. It will produce from one to two tons of hay per acre worth twenty five dollars per ton and the labor of obtaining the crop will be much less than it was before the land was drained. Now apply manure and large and valuable crops will be obtained. The increased value of the crop will, in two or three years, pay for all the work while the land will be worth double the price it would sell for before it was improved. In some cases the cost of draining will be three times as large as the figures we have given. Even these will pay. But there are a host of farmers who can improve their land at the above rates. Others still can do it cheaper. Others have upland which does not produce all it ought. Occasional plowing and heavy manuring will immensely increase their crops.—*Working Farmer.*

Horticulture.

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

THE VINEYARD.

Planting Grape-Vines.

One would suppose that so simple a thing as planting a grape-vine would not need writing about; and yet the number of people inquiring "How shall we plant?" is so great that a few words to these inquirers may well be pardoned by those who think they already know enough about the matter. Now, it is a curious fact that in the grape-planting on the hills along the Rhine the effort is to plant deep and also to keep the roots deep after they are planted. If the grape-vine cutting has been made of three eyes, as they often are, and roots are protruding from the two lower ones, the upper set of roots are cut away, and every year afterwards, in going over with the annual pruning, any roots which may appear from the stem just below the surface are kept cut away. Yet we know that in our soils generally the vine never, or at least very rarely, does well when the roots get deep; and so much is deep-rooting dreaded by English gardeners, that we find by English periodicals that in hot-house culture they even lay a bed of lime concrete under the grape borders to keep the roots from going deep, and to force them to remain near the surface. It has been known to a certainty that the grape-vine does best in our country on hills that are the dryest, and it may be that on these German dry hills referred to there is no injury as there would be on our damp subsoils; and there may be, under some particular system of surface culture, some advantage in keeping the roots away from the cultivators, when there is no harm resulting from their deep growth. Here, however, the rule is to plant the roots shallow. If they are long when we have to transplant them, instead of setting them deep we lay them along about four or five inches beneath the surface. It is of course very necessary to press the soil very hard and firm over the roots; that is, if the earth is tolerably dry, though in truth no tree should be planted except the earth is in this good condition.

It is very useful in planting a grape-vine to cut it closely in. Unless the last year's growth be very vigorous it may be almost all cut away; and even where this growth is strong, one-half may be cut away. This is the way to get a good strong cane for bearing next year, which is the most that one ought to expect a vine to do. "Immediate bearing" is a delusion and a snare. Many a person spends a dollar or a half dollar extra on a vine which he is told by the seller will "bear this year," when for that amount of money he could buy treble the quantity of grapes it will bear for him, even if it bears at all. Still we like to plant good strong healthy grapes. The little crowquills which come out as rare grapes at high prices, seldom give much satisfaction. Indeed it is more than likely that the immense failures which generally follow all these introductions are as much owing to the way their propagation is forced, as to any inherent inability in the varities to become adapted to soils and climates.—*Germantown Telegraph.*

How to Insure a Full Crop of Grapes Every Year.

The destruction of the first starting of the grape vines by the heavy frosts in April, and the consequent damage of this season's crop of grapes, is a serious matter to many interested parties. The crop was injured last year the same as it was this this, by the *too early* starting of the buds, which are depended on to produce the fruit and cane growth for the season. Could these buds be prevented from starting until the danger from frosts is past, then would the crop be sure. If the pruning is not done until after the 1st of April, it will insure any crop from danger of frost, for the reason that the only buds that will start early on long vines will be those near the ends of the vines, while the buds near the main stalk will remain closed until after all late heavy frosts, when they will be ready to open and produce a full crop of fruit and of vine growth.

When the vines are closely pruned early in the season, and the ground is cultivated, the result is the early forcing of the fruit-producing buds, and the consequent danger of damage by late frosts.

Parties owning very large vineyards may not find it convenient to delay pruning until the first or middle of April. But any person with a few hundred or thousand vines cannot fail in the long run, to gain great benefit by late pruning.

Several cultivators of the grape, with whom we have spoken, have this season tried the late pruning, and report in every case that the frost has not injured them, while it is the almost universal complaint all over the State that the entire crop of early pruned vineyards is seriously damaged. Mr. Lewis, who has charge of Mr Burrell's vineyard above Lexington, informs us that he has late pruned this season, and saved his entire crop by so doing. Also that vines early pruned are all cut off in the same neighborhood.

He also told of an old vineyard on lowland near Lexington belonging to a Frenchman. It had been carefully pruned and cultivated year after year and always had been cut off with frost until last year, when it was neglected, and that last year it produced the only good crop ever harvested from it.

We have been studying into this matter for some years, and every fact we have ascertained in the matter is corroborative evidence that the true policy is to prune late to escape the frosts.—*California Farmer.*

THE FLOWER GARDEN.

The New Weeping Birch.

We take great pleasure in calling the attention of our numerous readers to another Weeping Birch, the branches of which run directly towards the ground. It has received the distinctive name of "The Elegant Pendulous Birch," on account of its elegant pendulous habit. All the birches are very hardy, enduring the cold of our most northern limits, hence so beautiful a tree as this is a most valuable acquisition. The engraving will give our readers a very correct idea of the appearance of a young tree of this variety, with its long pendulous branches sweeping to the ground. We now have three very handsome varieties of the Pendulous Birch, the Cut-Leafed, Young's Weeping and the Elegant Weeping Birches. When we shall have added to these the Purple-Leafed Birch, we shall have a group of Birches that will grace any lawn, and grow in any part of our Province.

Roses.

Now is the time when the Rose Slug is defacing and ruining our rose-bushes, causing them to look as though the leaves have been scorched, and checking their growth for the season. We have been able by the timely use of white hellebore mixed with water, say a tablespoonful of hellebore in a gallon of water, sprinkled over the rose-bushes in the evening with a common watering-pot, to be an effectual remedy.

TRANSPLANTING.—In transplanting cabbages, tomatoes, etc., it matters not how clear the day or dry the weather, provided in every place a plant is put in you pour a pint or more of water into the hole around the roots, and then draw dry earth over the surface. The plant may droop for a little time, but will always recover and grow.

Hanging Pots.

You may have one, two or even three hanging pots in every window, almost without reference to sun, for many plants suitable for this situation seem indifferent to his presence. The equisite blue lobelia is very impatient of his beams. Smilax, too, popularly supposed to flourish only in hot-houses, does well in sunless situations, and is as valuable as beautiful; for no dantier adornment to a lady's dress can possibly be desired than its shining leaves and its graceful sprays. Be careful and keep off its deadly enemy, the red spider; for so certain as he touches those perfect leaves, their beauty is gone. Remember that eternal vigilance is the price of handsome smilax as well as liberty, and shower early and late whenever you can find time.

The freely flowing pink oxalis cannot be praised too highly for a hanging pot. I never knew the bonny, cheerful little creature to harbor insects; and its way of falling asleep at night and waking in the morning is irresistibly attractive. Its first cousin, the "oxalis flava," is very handsome and should be cultivated at all costs; but it is chary of its flowers and demands far more care from its possessor. The less common varieties of oxalis sold by florists are many of them very desirable both in size and in color; but they are comparatively delicate, and, perhaps, in unskilled hands might fail.—*Ex.*

Re-Potting Plants.

To ascertain if a plant wants fresh potting, turn it carefully out of the pot, with the earth attached to it, and examine the roots. If they are matted about the sides and bottom of the ball, the plant evidently requires fresh potting. Then carefully reduce the ball of earth to about a third of its original bulk; single out the matted roots and trim away all that are mouldy and decayed. Probably the same pot may then be large enough, but if it requires a larger one it should be about two inches broader for a middle-sized plant; three or four for a large plant. If the roots are not matted, but the pots are filled with fibres, keep the ball entire and carefully plant it in a larger pot. At the top of a large pot, an inch, and of a small one, half an inch should be left for the reception of water, without danger of overflow. A little gravel, charcoal, or pieces of broken pots should always be placed at the bottom for drainage.

A plant newly potted must never be exposed to a strong sun. It should be watered and placed in the shade immediately, and there remain till it is rooted, which may be known by its starting to grow.—*The Fruit Recorder.*

Put Flowers on the Table.

Set flowers on your table, a whole nosegay if you can get it, or put two or three, or a single flower, a rose, a pink, a daisy. Bring a few daises or buttercups from your last field work, and keep them alive in a little water; preserve but a bunch of clover, or a handful of flowering grass, one of the most elegant of Nature's productions, and you have something on your table that reminds you of God's creation, and gives you a link with the poets that have done it most honor. Put a rose or a lily or a violet on your table, and you and Lord Bacon have a custom in common, for this great and wise man was in the habit of having flowers in season, upon his table, we believe, morning, noon and night; that is to say, at all his meals, seeing that they were growing all day.

Flowers on the morning table are especially suited to them. They look like the happy wakening of the creation, they bring the perfume of the breath of Nature into your room; they seem the very representative and embodiment of the very smile of your home, the graces of good morrow; proofs that some intellectual beauties are in ourselves or those about us, some Aurora (if we are so lucky as to have such a companion) helping to strew our life with sweetness, or in ourselves some masculine wilderness not unworthy to possess such a companion or unlikely to gain her.—*Leigh Hunt.*

The Finest Fruit in the World.

The durion, a fruit about which very little is known in England, but which is reckoned by natives and Europeans in the Malay Archipelago to be the finest fruit in the world, grows in great abundance in Java and Borneo. It grows on a large and lofty forest tree, somewhat resembling an elm in its general character, but with a more smooth and scaly bark. The fruit is round or slightly oval, about the size of a large cocoanut, of a green color, and covered all over with short stout spines, the bases of which

touch each other, and are consequently somewhat hexagonal, while the points are very strong and sharp. It is so completely armed that if the stock is broken off it is a difficult matter to lift one from the ground. The outer rind is so thick and tough, that from whatever height it may fall it is never broken. From the base to the apex five very faint lines may be traced over which the spines arch a little; these are the sutures of the carpels, and show where the fruit may be divided with a heavy knife, and a strong hand. The five cells are satiny white within, and are filled with an oval mass of cream-colored pulp, imbedded in which are two or three [illegible] about the size of chestnuts. This pulp is the edible part, and its consistence and flavor indescribable.

A rich butter like custard highly flavored with almonds gives the best general idea of it, but intermingled with it comes wafts of flavor that call to mind cream-cheese, onion sauce, brown sherry, and other incongruities. Then there is a rich glutinous smoothness in the pulp which nothing else possesses but which adds to its delicacy. It is neither acid, nor sweet, nor juicy, yet one feels the want of none of these qualities, for it is perfect as it is. It produces no nausea or other bad effect, and the more you eat of it the less you feel inclined to stop. In fact, to eat durions is a new sensation, worth a voyage to the east to experience.—*The Garden, England.*

THE FRUIT GARDEN.

Raspberries.

The varieties of raspberry in cultivation with us are grouped under two divisions, which are usually designated as the Antwerp Family and the Black Cap Family. These classed under the Antwerp Family derive their origin either from the European or the American red raspberries. These increase by suckers which come up from the roots of the parent plant at various distances from it, and which being taken up and planted where it is desired they should grow, form strong plants or stools, which, in their turn, send up suckers, and thus continue the multiplication of the variety. These suckers yield fruit exactly like that of the parent plant, so that in this way the same variety is propogated and perpetuated. By sowing the seed new varieties are produced, bearing more or less resemblance to the parent in the color, size, and flavor of the fruit, but all like the parent in their habit of growth and mode of multiplication by suckers.

Those designated as belonging to the Black Cap Family differ from the Antwerps in the form and size of the fruit, and in the manner in which the variety is perpetuated. These raspberries do not send up suckers from the root as do the Antwerp class, but the growing canes bend over until the tips reach the ground, and these tips, towards the autumn, send out roots into the soil and form a bud at the surface of the ground. In the following spring these buds shoot up and form an independent plant, striking its roots deeper into the soil, and establishing itself for the production of fruit, and in its turn to repeat the process of rooting at the tips of the canes. New varieties of the Black Cap Family are produced from seed, but the variation is usually not very great.

In the "Small Fruit Culturist," by A. S. Fuller, published by Orange, Judd & Co., N.Y., at page 122, is a cut showing the manner of growth of the Black Cap, at page 125 the process of rooting from the tip is distinctly shown, and at page 123 is a plant with its bud and roots is shewn. If you can procure electrotypes of these, they could be serviceable in making the description of the manner of rooting at the tip more readily understood. If you procure them I can make reference to them. At page 145, in the same book, is a representation of the fruit of one of the varieties of the Black Cap family, and at page 157 is a single berry which shows the form of the fruit of the Antwery class. If the berries in the cut on page 149 could be altered to the form of the berry on page 157, then the sprig would show both the berry and the habit of growth, so that the reader could see, by comparing the cut on page 145 with the cut on page 149 thus amended, the difference in form of fruit and mode of growth at a glance.

The varieties of the Black Cap are hardy, enduring our changeable winters without any protection, and yielding annually full crops of fruit. The varieties of the Antwerp family are usually not perfectly hardy, but in some winters are so severely injured as very seriously to lessen the amount of fruit, and occasionally to destroy the crop altogether. On this account it is necessary, in some way, to protect during winter the canes of those varieties which belong to the Antwerp family, in order to be sure of getting a crop of fruit. This is done in various ways, the most common method being that of laying down the canes in the fall just before cold winter weather sets in. The canes are bent as near the ground as can be done without breaking them, and then covered with a light covering of earth.

(At page 136, in the same book, is an illustration showing how the canes are bent.)

The work is most expeditiously done by two men, one bending the canes lengthwise of the row while the other throws enough enough earth on the tips to hold them in place. After they are all thus bent down, the covering may be completed by running a plough between the rows or by the shovel. Another method which may be adopted where evergreens are abundant, is to thrust into the ground, on each side of the row of raspberry canes, evergreen boughs, so as to quite screen the canes from sun and wind. This has been found to answer an excellent purpose.

But cultivators are anxious to secure fruit with the least possible amount of labor, hence varieties of the Antwerp family have been sought for which were sufficiently hardy to endure our winters without any protection. Hence hybridist have been trying, of late years to produce crosses between varieties of the Antwerp family and the Black Cap family, in the hope of raising a hybrid which shall yield berries of the size and flavor of those of the Antwerp family, and possess the hardihood of the Black Caps. We notice at page 59 of the report of the Fruit Growers' Association for 1872 that W. Saunders, of London, has succeeded in raising 20 plants from that of the "Doolittle," a variety of the Black Cap, fertilized with pollen from the Philadelphia. Some of these, we understand, give promise of being very valuable acquisitions, being very hardy, very productive, and the fruit of good size and quality.

At present we have only one variety which is propagated by suckers that can be called hardy, namely, the

Philadelphia.

This will pass through nine winters out of ten without injury; but we have once seen the canes of this variety killed back about half their length. It is very productive, yielding very large crops. The berries ripens up in a short time, so that the crop is harvested in two or at most three pickings. In this respect it differs from the Brinckle Orange, which continues in bearing for six weeks, ripening a few berries at a time. It is better for the market gardener that the fruit should ripen all at once. It is a very great saving of labor to be able to pick the crop by going over the ground only a couple of times instead of half a dozen. The amateur will probably prefer that a fine variety should extend its period of ripening over a long period of time for giving a continuous supply without regard to the time consumed in walking along the rows to gather the fruit. The berries are of full medium size, more globular in form than most berries of the Antwerp family, of a dark red color when fully ripe, of good quality, but not of the highest flavor. It is a good variety to grow for a near market, but not as firm as other sorts, and therefore not as well adapted for transportation to a distant market.

The leaves are thick and tough, and bear the heat of our July sun's without flagging, so that the plants do not seem to suffer as much as others under a long protracted drouth.

Wherever hardihood of plant, enduring summer heats and winter's cold, and large quantity of rich-colored, fair-sized fruit are items of prime importance, the Philadelphia will fill the requisition better than any other raspberry of this class with which we are acquainted. Next to it in hardihood stands the

Franconia.

Occasionally the winter injures it, killing it back severely and seriously diminishing the crop, but in those sections where the peach tree usually fruits, this raspberry will rarely be injured. It is a very productive sort, yielding large crops of handsome, deep purplish red berries, of large size, sufficiently firm to carry well to market, and of a rich, sprightly and agreeable flavor, which is retained for a considerable length of time after the fruit is gathered. It has been more generally grown for market than any other sort on account of its productiveness, size of fruit, and firmness of the berry, enabling it to endure transportation. It thrives best in a rich, cool, moist (but not wet) soil, deep and loamy.

Brinckle Orange.

In our estimation this is the best-flavored raspberry in cultivation, and well adapted for the garden for family use. It is not hardy, and will require winter protection in order to be sure of a crop. In the County of Lincoln it will pass the winters safely without protection more than half the time, and oftener if growing in a well sheltered location. The fruit is large, handsome, being when ripe of a beautiful rich orange color, especially at the point, juicy, sweet, rich and high-flavored. A dish filled with the fruit has a beautiful appearance, and is both ornamental and acceptable at dessert or on the tea-table. The plants delight in a rich, deep, moist soil, yield very abundantly when not injured by the winter, and beginning to ripen in the usual season of raspberriess, continue to perfect their fruit gradually for fully six weeks, thus protracting the supply for a considerable length of time.

The foregoing varieties are of that class which throw up suckers from the roots, and which we have designated as the Antwerp family. We think these three to be on the whole the best for our climate of the kinds that have been thoroughly tested in it, and the most likely to give good satisfaction in quantity and quality of fruit. Of the Black Cap family we designate two sorts only, having been on the whole best satisfied with these.

Davidson's Thornless.

This variety has the merit of being destitute of thorns, save a very small one on the leaf stalk. Those who have had experience of many and severe stratches, with the not infrequent addition of torn garments, in gathering the fruit of the Black Cap raspberries, will be able to appreciate the comfort of picking these berries from bushes that bear no thorns to lacerate the hands and tear the clothes. The fruit is of medium size in its class, ripens early, when ripe is black, sweet and of good flavor. The plants are vigorous, very productive and perfectly hardy.

Ripening immediately after, and thus continuing the season, comes the

Mammoth Cluster,

Which in the writer's opinion is the largest and best of this family. The canes are very strong, branching, not without thorns, perfectly hardy and enormously productive. The fruit is large, black, with a handsome bloom, juicy, sweet and fine flavored, and the size holds out well until the fruit is all gathered.

The fruit of both these varieties, and indeed of nearly all the Black Caps, is sufficiently firm to bear transportation to distant markets. There are varieties of this family that produce fruit of a light yellow color, but we have never seen any that were as high flavored as the black sorts. The best of the light colored berries is the

Golden Thornless,

The fruit of which is of a rich golden yellow when ripe and of large size. The plants are mostly thornless, quite hardy and very productive. Any one having these six varieties will be able to supply his table with an abundance of this fine fruit throughout the entire raspberry season. We have not described any of the autumn-bearing sorts. The truth is they are not very valuable. The consumers of fruit have already had enough of the raspberry in its season, and do not care to continue the raspberry flavor when so many other fruit flavors are at command. Apples, pears, peaches, plums and grapes are to be had before the autumnal raspberries are ripe, which yield an almost endless variety of flavors to tempt the palate with new delights. But if any are desirous of having raspberries come again just before the snows of winter fall, they may plant *Belle de Fontenay* of the Antwerps and *Lurn's Everbearing* of the Black Caps. In order to secure a good crop of autumn fruit it will be necessary early in spring to cut off all the canes even with the ground. The shoots that will then come up will bear abundantly and be likely to ripen their fruit before winter. Perhaps in those parts where it is difficult to raise apples, and where pears are an impossibility, it may be possible to give a greater variety to the table by growing these autumnal-bearing raspberries.

Nut Trees.

While people are planting trees for shelter or ornament, it is often quite as well to select those that will produce something immediately useful as well. What are called fruit-trees are not exactly the trees for shade or ornament on lawns where the grass is kept mown, and things neat and tidy generally, because there is always more or less of dirt and disorder under them, by people going after the fruit. They are beautiful enough at certain seasons it is true. Nothing

is more charming than a peach or an apple tree in bloom. But this is soon over, and then there is no more for the season. Besides this, as timber trees, they are of very little use, an old cherry tree, if it has a good trunk, which, however, it seldom has, is useful to the cabinet-maker; the apple is sought for near large towns by last-makers, and the pear by mill-wrights; but these cases are so exceptional that one may say as a rule, fruit-tree timber possess but little value. The walnuts on the other hand are always valuable. There is no more profitable wood than the black or English walnut. The hickory is another valuable wood closely allied to the walnut; but too slow in growth for the purposes we suggest. The pecan-nut, also near the walnut, grows with great rapidity; but north of the Potomac river it only bears a perfect fruit at rare intervals. The black and English walnuts are, however, very rapid growers; and in good soil soon come into bearing. Trees in rich earth have been known to bear in ten years from the seed. This is of course when they have not been disturbed by transplanting. But one need not wait this long; for in many cases trees can be procured five years or more grown, which materially reduces the time one has to wait. The English walnut generally bears well in this region, though sometimes it does not, through the destruction, the gardeners tell us, of the early male flowers; but wherever it is in a sheltered situation it is pretty certain to bear every year. It is objected to by some that the walnuts are great feeders and rob other crops of the nutrition they ought to get. This is true to a great extent. But there are often spots in which a walnut could be planted where this fact would be no great objection.

Though not exactly to be classed among trees, the filbert-nut is a very worthy plant to have in one's garden or in odd places about the farm. It has indeed been supposed that they could be grown in this country with great profit, though we know of no one who has tried his hand at it. Certainly in view of the prices people have to pay for the nuts at our fruit-stores, there ought to be something in it; but this does not always follow, as many people who have to sell to the stores know to their sorrow how great is the difference between the price a storekeeper asks for a fruit and that which he is willing to pay for it. A filbert bush in light rich soils will bear in about five years and generally produces very heavily after it once begins. They do not do well on wet soils. These little things are luxuries to many a country garden; and they may be had at a very cheap cost wherever there are soils suited to the purpose, and this is nearly everywhere.

Kohl Rabi.

The root crop is generally considered the foundation of good farming on light land. The Swede turnip, once the sheet anchor of light land farmers, was for several years a failure in this neighborhood. The failure of the Swede necessitated the trial of a substitute, and the Kohl Rabi has, to a great extent, taken its place. The Kohl Rabi is said to have been introduced from Germany. It first became generally known in England in 1837, when the turnip crop was destroyed by caterpillars. The dry season of 1864 and 1868 brought it into general use, and many farmers who had been in the habit of growing a large breadth of Swedes have not grown a single acre since, but have cultivated the Rabi instead. Great as was the loss sustained by the partial failure of the turnip, it at least taught us the value of the Rabi, which in dry seasons is almost invaluable. The Rabi has the advantage of being more certain than the turnip, and a good crop may be grown any year. It is more adapted to light than to heavy land, and will do better in a hot dry summer than in a wet one, as in the latter it is apt to grow too much top, without a sufficient development of bulb. It is very nutritious, and will produce considerably more meat than turnips, weight for weight. All kinds of stock do well on it, and I have noticed that when getting anything up for showing, whether horses, beasts, or sheep, my men all prefer it to turnips or wurzels. It is hardier than either of the above, at any rate it will stand frost better. I do not think any roots are so good after being frost-bitten as they were before; but though I have known the Kohl Rabi frozen almost as hard as stones, I have rarely known an instance in which the crop was to any considerable extent destroyed. The worst case I remember was when snow, thaw, frost, thaw, and frost succeeded each other in rapid succession, so that the bulbs were frozen when in a wet state, and were nearly all spoiled. As a rule I have lost more by *growing* them up too soon than by letting them stand too long, though it is well to have sufficient up to carry you through an ordinary frost, care being taken not to get them up in wet weather, as they are liable to heat, mould, and rot. If got up when dry they will keep a long time.—*Gardener's Chronicle and Agricultural Gazette.*

Blackberries.

At a late meeting of the Indiana Horticultural Society, Mr. Ohmer said he had been very successful in growing blackberries. He had been in the business fifteen years, and lost but two crops in ten seasons. Three acres had averaged him $1,000 per year. His rows were eight feet apart and he sets his plants four feet apart in the row. He planted posts three feet high, at intervals of thirty feet, and from nails in the top of the posts he stretched wires from post to post, to which the vines were trained. He plowed once in the spring between the rows, and then put in the cultivator or harrow. He did not seek to make large canes, as these do not produce the best crops. He trimmed back when the vines are three or four feet high. Allow the old wood to remain among the vines from year to year, as a support to the young vines. The laterals, he cut back two feet, or even less, if the vine was delicate. Did not allow them to grow too thick, and no plants were allowed between the rows. The Kittatiny was his favorite, and if he were to plant ten acres he would plant all of that variety. He marketed in half-bushel drawers. Raspberries pay better when sold in quart boxes. His soil was clay with a substratum of gravel. Did not manure at all.

Growing Cabbage Plants.

First, don't sow seeds in the seed-beds too early, certainly *not* before the middle of April. Better wait until the weather will warrant a continuous growth from the seed to the mature plant. The best and earliest cabbage can be grown only from plants whose growth is uninterrupted and continuous from the first.

Second, for the main crop of late varieties, and indeed with all varieties for the average farmer with whom extreme earliness is not an object, better plants can be grown in an open seed-bed or cold frame than in a hot-bed with bottom heat. Choose a sheltered position, and light black loam at the proper season you can grow fine plants without the trouble of a hot-bed, as the cabbage grows in cool soils and cool weather.

Third, give plenty of room in the seed-bed for the plants. They should not be transplanted until they have developed *six or eight* leaves. By no means allow young plants to be crowded in the seed-bed, for if they are drawn, that is, grown so as to be slim and tall, they will not be as liable to make heading plants. Fifty plants if grown to *transplanting* size, it seems to us, ought to have more room than one foot square.

Fourth, to prevent the ravages of the cabbage fly on the young plant, sprinkle ashes freely over the plants, or red dust will answer equally well. Radish plants among them will also protect the young plant, as the flies prefer the radish. A better plan, however, is to elevate the seed-bed four feet or more above the ground. In a shallow box it can be easily done; and the plants are seldom or never touched by the bugs or flies.

Fifth, set the plants at such a distance apart that when full-grown they will cover the entire ground. Plants will then head better than if given unlimited room. The distance will vary with the variety all the way from three and a-half feet for the Marblehead Mammoth, down to eighteen inches for the Early York.

Sixth, set on rich, moist soil in good tilth, and give plenty of *hoeing and horse-culture.*—*A. L. Hatch, in Germantown Telegraph.*

FRUIT AT THE VIENNA EXPOSITION.—A correspondent of the *Tribune* says of the fine display of winter apples and pears that it is really fine—"apples as plump and rosy-cheeked as if just picked from the tree, and pears as fragrant and toothsome as any that come from California in August to our New York markets. Our American farmers know how to keep apples until July brings a new crop of Early Sweets and Harvest Pippins, but I doubt whether many of them have eaten great, luscious, mellow pears in the middle of May. The best preserved varities in the Exhibition are the Dechants, the Vergalieu, the Herrn, the Oster, the Butter, and the Apothecary, and they come from Styria, Trieste, and Wurtemburg. The finest apples are from Pomerania and Wurtemburg.

Apiary Department.

An Old Man's Views on Hives.

(*From the American Bee Journal.*)

If the great losses annually sustained by the bee-keepers of this country, did not so often fall on those who are the least able to bear them; the old, the feeble, and on such as are unable to procure a living by more laborious callings; I should feel greater reluctance on account of my age, being nearly seventy-seven years, which necessarily renders me an old fogy in the opinion of so many; the fact that I have not attempted to write with a pen in ten years, on account of my trembling hand, to present this communication to brother bee-keepers, who may have had the same woeful experience as myself in regard to the safe wintering of bees. yet I hope there are some, among the many, who will not too severely censure what is well intended, if its want of merit should prevent their approbation.

I have read, with great interest, the discussion of the bee-keepers of this wide country, in their conventions, as reported in the *The Bee Journals*, on all the topics in relation to bee-keeping; and I marvel that so many bee-keepers should have been so mistaken in regard to the *cause* of the calamities attending the safe wintering of bees, and should have entirely overlooked the absolute necessities of the bees, in the construction of all the improved hives now in general use; when such hives could have been so easily made to conform to the necessities of the bees, without abating anything from the value of the improvements. The All-wise Creator, no doubt, has given to the creatures He has created, instincts in accordance with their natures, and to the honey bee the instinct to provide for its own future wants in winter's cold, and summer's heat and wet, and drouth, (without any aid from man,) and to propagate themselves in every country, and in every lattitude through all time, wherever the Creator Himself had provided for their necessities. In the native and natural bee hive, the entrance is below the place occupied by the bees, and the air space above, and below the entrance, is often from two to five times as large as the space occupied by the bees; and if it is not larger, than in the improved hives, it is the exception, and is not common. Now a bee hive cannot hold itself twice full at the same time, any better than anything else. In the first plan, the hive is full of air, and whatever is put into the hive forces out so much air. The space occupied by the bees is all filled with combs, without any air space around them, except below, and these combs may all be filled, (and often are,) with brood and honey without any detriment to the bees. Almost every person knows that air seeks to be of an even temperature, the same as water seeks to be of a level—that air expands when heated, and is therefore lighter to the cubic inch, or foot, than cold air. Now in the natural hive, this large air space is necessary—it is cooler in summer, and warmer in winter; it lets the dead bees and everything fall down clear from the combs, and keeps them clean and dry—it contains so much air, that it cannot become moist from the breath of the bees; and when cold weather approaches, the pressure of the cold air at the entrance compresses the warmer air on the inside of the hive, and the cold air enters, but it *cannot* go up, and *must* go down, because its specific gravity is greater, and the warmer air rises up and is constantly floated toward the bees, and the warmest air at the top being the most expanded, is the most easily compressed and as it increases in density, increases in specific, gravity, and sinks down and is forced out at the entrance; and this gives a little more room for cold air to enter; and thus a constant circulation, equalization and purification of the air is kept up in accordance with the established laws of nature: and thus safe wintering is the rule, and not the exception. Any disregard, evasion or violation of these laws, will endanger the lives of the bees.

Let us now look at the difference between the natural and improved hives, now in general use. The standard size of the improved hives contains two thousand cubic inches, which is less than one foot and a quarter, cubic measure. This hive, if filled with frames of combs full of brood and honey, will occupy

two-thirds of the space, except the half inch under the frames: and now if you put in a common swarm of bees, of twenty or thirty thousand, that is from four to six quarts of bees, the hive must be nearly or quite full, except the half-inch space under the frames. Now, as I said before, a bee-hive cannot hold itself twice full at the same time. It is also a conductor of heat and cold, but not of air; and when cold weather comes on, and the bees are all confined within the hive, this very small amount of air, for so many bees, must soon become very moist from the breath of the bees; and if the air outside of the hive is moderated by beehouse, cellar, or other contrivances, and is too warm, the pressure at the entrance will not be sufficient to force into the hive sufficient air to abate the moisture, and the poor wet bees sweat it out as best as they can. For this moisture cannot be abated with quilts and absorbents, so long as the bees have the breath of life in them, any more than the moisture from a kettle of cooling water in a hot stove, can be abated with lining the room with absorbents. The absorbent will only keep the moisture from increasing and condensing, but cannot abate it so long as there is water in the kettle, and fire in the stove. "Upward ventilation will do it," many are ready to exclaim. Upward ventilation is better than no ventilation, but it is unatural, as the bees have been created with fickle natures, and erring instincts. Ventilation at the bottom is unsafe in the improved hives, because the dead bees are almost sure to fall down and close the entrance, and the bees must have ventilation somewhere. But the bees are tough little fellows, and can stand a good deal of wet, if warm, and a good deal of cold, when dry; but like other creatures, they cannot stand wet and cold both at the same time. If the air is too cold on the outside of the hive, the pressure at the entrance is great, and the air is pressed into the hive with great force, and the circulation becomes rapid, the power of the bees to keep up the necessary heat is lessened, and the hive is cooled, and the moisture condenses and falls back on the bees, like dew to the ground when the sun goes down; the quilt and absorbents have lost their power, and their utility is destroyed. Now the poor wet bees will have the dysentery in two minutes after they become chilled, and will fall down, and as there is but a half-inch space below the frames, this space is soon filled up, and they lodge between the combs, the combs are already wet with moisture and filled with dead bees, the combs soon begin to mould, and the dead bees to decompose, and the moisture increases. There is now an absolute necessity for a good bee doctor to know what's the matter; and to know how to get into the hive, the right quantity of pure air, of the right temperature, and to force out the bad air.

"Too much honey," exclaims lots of bee-keepers. This is not the cause but the effect. Take out two or three frames of honey, and put in boards that will exactly fill the place of the frames taken out, and the effect will be the same. It is not less honey, but more air that the bees need, and it requires great experience and skilful management, to so winter a hive of bees, with a few cubic inches of air, that *safe* wintering will be the rule, and not the exception. While here in this cold latitude of forty-five degrees north, bees are suspended in their natural hive, from twenty to fifty feet in the air, and swayed about all winter by the winter winds, enough to make a sailor sea-sick, yet these bees put in their appearance all right in the spring. This is the rule, and not the exception. How to improve the improved hives is the question. As it is hardly an invention, but as the old woman said, a nice contrivance; I shall not apply for a patent, and any one who wishes, can easily apply it to any kind of hive.

Make a tight box that will just fit the outside of the hive, set an inch post in each inside corner of the box, an inch shorter than the depth of the box; place the hive without a bottom on these posts, the box will now close the entrance; make it all tight as possible between the box and the hive, and make the ventilation two or three inches from the bottom of the box. The hive will now contain four or five times as much air as it did without the box, and if put in any building sufficiently comfortable for horses or cattle, according to the amount of animal life it contains, with a sufficiency of pure air, it is warm enough for bees. A bee house or cellar that is only large enough to hold twenty hives of bees with a sufficiency of pure air, should not be made to contain fifty hives; any more than a stable sufficient for ten horses or cattle, should have twenty crowded in. In the spring when the bees are set out, saw a pole about six inches square in the bottom board of the hives, and tack a piece of wire cloth on, and place it on the box for their summer stand, close the ventilation in the box till the weather becomes warm, and the bees need no more air than is given at the entrance.—ISAAC ANDRUS, in *Bee Journal*.

Entomological Department.

Insect Troubles in Bruce.

Mr. Simpson, of Amabel, writes in great trouble respecting the insect depredations in his neighborhood. he complains that grubs are eating up everything in the gardens, not leaving a vegetable even an onion, and desires to know what he can do to put a stop to their ravages.

Without specimens or any other information to give us a clue to the particular species that are making themselves so obnoxious, it is quite impossible for us to afford any definite or satisfactory advice in the case before us. There are so many hundreds of different kinds of insects that prey upon vegetables, each having its own peculiarities of habits, time and mode of appearing and feeding, &c., that any remedy we might prescribe would be but a guess, and probably fail altogether in being effective.

As mention has been specially made of the onion, we may mention that we know of but three insects that are injurious to it, viz.:—The black onion-fly, *Ortalis Flexa*, the imported onion-fly *Anthyomia Cyparum*, and a thousand-legged worm *Julus*. The two former in their larval, or maggot state, and the latter in all stages of its existence, attack the roots of the onion, and frequently prove excessively destructive. They may all be destroyed by pouring hot, almost boiling, water over the affected roots.

The insects injurious to other garden vegetables are so numerous and so varied in their habits, that we cannot enter into a particular description of any without some further information—with specimens, if possible. Our correspondent asks whether it would be of any use to sow the land with salt, in order to get rid of the grubs. Our opinion is that enough salt to kill the insects would destroy almost all vegetable life.

Tent-Caterpillars.

Both the American and the Forest Tent Caterpillars (*Clisiocampa, Americana*, and *Sylvatica*) appear to be more than ordinarily numerous this year. In our own garden and orchard they seem to defy all attempts to get rid of them, as we rather neglected them at first, relying too much upon our supposed extermination of them during the previous two years. The only safe method is undoubtedly to go carefully over the trees and destroy every web with its inmates at the commencement of the season, that is, as soon as the buds of the apple-trees begin to expand. Then the work is easy and detection of the pests no trouble at all, but later on they scatter over the trees and wander hither and thither in search of food.

Just now, something may be done in anticipation of next year's work. The caterpillars have nearly all disappeared and gone into the chrysalis state. The cocoons may be found almost everywhere—under loose bark and in crevices about the trees, under projecting parts of fences and buildings, under loose boards and rubbish, wherever, indeed, shelter is to be obtained. We have found some enclosed also in leaves upon the trees, and so carefully enrolled as almost to defy detection. We need hardly say that all these cocoons should be pitilessly destroyed. They may be distinguished by their semi-transparent outer wrapping of loose silk or web, through which may be seen the inner envelope thickly sprinkled with a pale sulphur-yellow dust.

As the moths are commencing to emerge from these cocoons no time should be lost before searching for and destroying them. The moths, themselves, are very commonly attracted into houses by lights at night, and thus come of their own accord to be killed. They are thick bodied, dull brown creatures, with oblique pale streaks across the wings, usually they rush and flutter and fuss about one's lamp at an alarming rate, as if most anxious to attract observation.

The larva of the Forest Tent-caterpillar differs conspiciously from that of the other species in having a series of white spots instead of a continuous white stripe along the back; and the moth is of a much paler tint, with dark stripes across the wings instead of light ones.

Destroying the Coudling Moth Worm.

Dr. LeBaron says, in the *Prairie Farmer*, that half and probably more than half the apple worms have escaped from the apples before the apples fall; hence he thinks the importance of picking up these apples or of allowing hogs to run in the orchard, has been over-estimated. As to another mode of destroying these worms, he says:

"Soon after the young worms have entered the apple, which they generally do at the calyx end, they begin to throw out their castings through the hole which they made in entering. As this hole must be originally very small, it is evident that they must enlarge it for this purpose. A portion of these castings adhere to the rough and shriveled calyx, forming a rust-colored mass which can be easily seen from the ground beneath. Some horticulturists, among whom we may mention Mr. Oliver Chapin, of East Bloomfield, N. Y., and Mr. L. Barnes, of Bloomingdale, Ill., have availed themselves of this circumstance for the purpose of removing the wormy apples from the trees before the worms have escaped. Mr. Chapin's plan is to beat off the wormy fruit, but Mr. Barnes adopts the method of picking them off by means of a wire hook attached to the end of a pole. These methods can be usefully combined by first jarring or beating off those apples which readily fall, and then going over the trees a second time with a pole and hook. The apples thus removed should, of course, be fed to swine, or otherwise treated so as to destroy the worms within. Too much value cannot be attached to these simple expedients, which, in the case of a few choice trees, or even a small orchard, might almost be made to supercede the necessity of any other treatment." – *Western Farmer*.

The Toad and the Ants.

The following scene was lately witnessed: A toad which had slept, or laid quietly under the garden fence through the greater part of a hot day, came out, just as the sun was going down, to seek for his supper. A colony of ants had established themselves on the edge of a flower-bed, and were very busy enlarging their underground habitations. Among them were several winged ones. The toad discovered the ants, and prompted doubtless by "the keen demands of appetite" proceeded to devour them, selecting at first the winged ones, which, excepting a few that took flight or went into the ground, were soon gobbled up. But in his greediness the toad exposed himself to the attacks of all the working ants, which fastened their sharp forceps on those parts of his body where the skin is the thinnest, and soon made him retreat to his lair under the fence. But by vigorous jerks of the body, snaps of the jaws, and scratches with the fore feet he soon cleared himself of his tormentors, the greater part of which were swallowed.

He now prepared for another charge on the ants' fort: but this time, instead of jumping at once into the midst of the defenders, he made a circuit and came up in the rear, sheltering himself under a luxuriant verbena. From this point he surveyed the ground, and renewed the attack by snapping up first the scouts and rear guard, slowly clearing his way toward the main body, taking all that came within reach, till at last the remnant of the "little" people were glad to hide themselves in their den, at the mouth of which the toad stood guard. While this had been going on, several spectators had gathered. When the toad found there was no more ants to be got, his appetite being still unappeased, he turned to look for something else, and espying a fly on a gentleman's boot, snapped it as quickly as a flash. Other flies alighted on the clothing of the bystanders, several of which the toad caught by springing up to the height of nearly a foot. He has since made his appearance in the same locality, nearly every evening, about sundown, and his sagacious movements are watched by various persons with interest.—*Boston Cultivator*.

An Insect Palace.

Sir John Hill has given the following curious account of what appeared on his examining a carnation: "The principal flower in an elegant bouquet was a carnation; the fragrance of this led me to enjoy it frequently and near. The sense of smelling was not

the only one affected on these occasions; while that was exalted with the powerful sweet, the ear was constantly regaled by an extremely soft, but agreeable murmuring sound. It was easy to know that some animal within the covert must be the musician, and that little noise must come from some little creature suited to produce it. I instantly distended the lower part of the flower, and placing it in a full light, could discern scores of little insects frisking, with wild jollity, among the narrow pedestals that supported its seeds, and the hairy threads that occupied its centre. What a fragrant world for their habitation! What a perfect security from all annoyance, in the dusky husk that surrounded the scene of action! Adopting a microscope to take in, at one view, the whole base of the flower, I gave myself an opportunity of contemplating what they were about, and this for many days together, without giving them the least disturbance. Thus I could discover their economy, their passions and their enjoyments. The microscope, on this occasion, had given what nature seemed to have denied it to the objects of contemplation. The base of the flower extended itself under its influence to a vast plain; the slender stems of its leaves became trunks of so many stately cedars; the threads in the middle seemed columns of massy structures, supporting at the top their several ornaments; and the narrow spaces between were enlarged in walks, parterres and terraces. On the polished bottom of these, brighter than Parian marble, walked in pairs, alone, or in large companies, the winged inhabitants: these, from little dusky flies, for such only the naked eye would have shown them, were raised to glorious, glittering animals, stained with living purple, and with a glossy gold, that would make all the labors of the loom contemptible in the comparison. I could, at leisure, as they walked together, admire their elegant limbs, their velvet shoulders, and their silken wings—their backs vying with the empyrean in its blue; and their eyes, each formed of a thousand others, out-glittering the little plains on a brilliant; above description, and too great almost for admiration."

The Army Worm—Its Origin and Mode of Destruction.

This worm passes the winter season in a pupa or larva state in the ground, and as the warm weather of spring approaches it works its way to the surface goes through the natural transformation incident to all this class of insects, and hatches or bursts its covering and comes forth a miller or moth about the size of a silk worm moth, or a little larger than the common house. This moth by instinct lays its eggs upon new and tender vegetation, where the young worm will find food adapted to its wants.

The facts above stated will indicate to every thinking mind one of the most effectual modes of destruction, and one that is recommended by entomologists. It is this, to plough the ground late in the fall, in cold climates, and thus expose the larvæ to the cold and kill them by wholesale while in that state in which there are fewest of them in number.

Another mode of destruction recommended and practiced by many is to roll the ground with a heavy roller. This may be made pretty effectual, and will not result in injury to growing vegetation upon meadow and pasture lands, or upon the grain when small.

To protect our crops here from destruction we have resorted in many instances with success to the practice of running a ditch around them when threatened. The ditch should be dug so that the worm will fall into it easily from the side towards which the drove of worms is approaching, but on the opposite side, or towards the field to be protected, it should be abrupt, or better, the side should be made to project over the ditch so as to prevent the worm from crawling out when once in.

It is also recommended that every rod or so there be dug in the ditch holes in which those that attempt to travel along the ditch may fall. When the worms have already made an entrance into vineyards, especially when on warm, sandy land, it is recommended that the soil be ploughed up freshly and that then each vine be jarred so as to precipitate the worm into the ground in the heat of the day. The heat of the sun and that of the sand will destroy large numbers before they can reach the shade or any vegetation for protection. It has been noticed that alfalfa fields are great harborers of these worms. This results from the fact that this grass presents to the moth the most favorable condition—plenty of good tender food for the young worm rather than any other reason. The Sacramento Beet Sugar Company have adopted a novel mode of getting rid of the army worms among their beets, and at the same time turning the worms themselves to account. They have already put three hundred turkeys gobbling up the worms, and intend to turn two or three hundred more in the field in a few days. They have been compelled to purchase the turkeys this season, but intend to enlarge or extend their business in the future by raising their own turkeys. The company are of the opinion that a diversity of *crops* is advisable, at least for the present emergency, and are in hopes that by the introduction of the turkeys their sugar crop will be considerably increased, and at the same time that they may realize some profit from the turkeys themselves.—*Daily Record.*

Aphides, or Plant Lice.

The Aphides constitute one of the most extensive families of insects, and also one of the most diversified in their habits and their modes of life. Regarded from this latter point of view, they may be conveniently divided into four sections. First, the leaf lice, or Aphides proper, distinguished by their long, tapering seven-jointed antennæ, and the honey tubes on their abdomens. These live upon the leaves both of trees and herbaceous plants, or on the tender growth of the current year. They are diffused upon almost all kinds of vegetation, and those inhabiting different kinds of plants are often so much alike in their organic characters as to render it doubtful whether they are different species, or only plant varieties of the same. The leaf lice are very tender insects, and are often suddenly swept away by unfavorable changes of the weather. The most troublesome variety is that which infects hot-houses, where they thrive and multiply by virtue of the warmth and protection which they enjoy in common with the plants. The common remedy for them is the fumes of tobacco. It is a good plan to apply the tobacco smoke two or three successive days, as one exposure to it is often found to stupify without killing them.

Second, the twig lice, belonging to the genus *Lachnus*. These are distinguished by their six-jointed antennæ, the honey tubes being very small or rudimental, and by their usually dotted abdomens. These are found in the smaller limbs of the hickory, the willow, and probably other trees. We have seen them on young apple trees, but in this instance it was evident that they had migrated thither from some neighboring willows. With this accidental exception, we believe none of the plant lice of this section have ever been found on any of our fruit trees.

Third, the root lice, comprising several genera, with still shorter antennæ, and the honey tubes wholly wanting. These infest the roots of plants, often causing their death, and they are therefore much more serious pests than any of the other varieties. The root lice which infest the roots of young apple trees (*Eriosoma pyri*); and those found upon the roots of the grape vine (*Phylloxera vitifolii*), are the most important species in this section. Both of these species are much more abundant in the southern than in the northern half of this state. The best preventive of the spread of these insects is to examine the roots of young trees or vines when taken up for the purpose of transplanting, and if found to be infested by the root lice, to immerse them for a few minutes in hot soap suds or tobacco water. The presence of the lice is generally indicated by the swellings or knots upon the roots which the lice produce.

Fourth, the gall lice, or more definitely, the gall-making Aphides, for galls are also made by other insects, to some of which, especially the gall-making *Acari* or *mites*, the term gall lice would be still more appropriate.

The Aphides of this section inhabit those hollow swellings on the leaves and stems of plants, known by the name of galls. These, when first seen in the spring, contain a solitary female, which before midsummer gives birth to a numerous progeny, which dwell crowded together in the cell for a time, but leave it and disperse later in the season. Galls made by Aphides are found on the leaves of the grape, and the elm tree, and at least two species inhabit the cottonwood. The curious galls found upon oak leaves, and known as oak apples, are made by little wasp-like insects belonging to the order Hymenoptera. Galls are found mostly upon forest trees, and as a general rule are unsightly rather than seriously injurious, but young trees are sometimes seriously damaged by them.

It is one of the admirable provisions of nature that those insects which are stationary during the greater part of their lives, such as the scale insects and the gall insects, not only select with wonderful discrimination each its own particular kind of tree, but in some instances different species of the same family exhibit a strong predilection for some particular part of a tree, and different from that selected by others. For example, the scale insects of the genus Mytilaspis, to which the oyster-shell bark louse of the apple tree belongs, are generally found much the most abundantly on the lower branches. This is exemplified to some extent by the apple species, and more strikingly by the white scale insect on the leaves of the pine. In curious contrast with this is the habit of a closely allied species, specimens of which have been sent to me by Prof Uhler, of Baltimore, which were found upon ornamental linden trees in that city, and which were so exclusively confined to the upper parts of the trees that he obtained his specimens only from branches which had been brought to the ground by pruning. A similar distribution of species occurs in the gall-making Aphides of the cottonwood, one of which (the *Pemphigus vagabundus*, Walsh), often forms its large corrugated galls on the topmost twigs, whilst another species (the *Pemphigus populicaulis*, Fitch), which forms the bullet-like swellings at the junction of the leaf with its stalk, is for the most part confined to the lower branches. This is only one exemplification of the law of diffusion of species in nature, whereby all parts of her domain become peopled by living and sentient beings. It is evident also that this localization of particular species may some times afford us important practical suggestions by giving to our remedial measures a more definite aim.

With regard to the above classification of the Aphides, according to their modes of life, it is proper to remark that it must be regarded as one of practical convenience, rather than of scientific accuracy. This follows from the fact that we sometimes find in the same genus species which vary greatly in this respect; and in other cases, as in the gall louse of the grape leaf, it is now pretty well determined that the same species may make and inhabit galls at one period of its life, and at another migrate to the roots.—*Prairie Farmer.*

The Canada Farmer.

TORONTO, CANADA, JUNE 30, 1873.

Sheep-Killing Dogs.

"What *is* to be done with these intolerable nuisances?" Such is the cry we again hear from all quarters of the country; and it is quite evident from its universality and earnestness of utterance, that our laws and by-laws, stringent as they may seem, do not meet the case. We know of nothing more tantalizing to the careful and laudably ambitious farmer than this nuisance; and we quite agree that measures of the utmost rigor should be exercised to put an end to the abuse. It is but a sorry compensation to the bereaved farmer to kill the offending cur, or to be told that it has been killed by others. And almost equal mockery is the compensation obtained for perhaps a fifty-dollar ewe, from the five or six dollars, and often less, per head obtained after formal petitions, arbitrations and other vexations before the Township Council. The nuisance must be stopped in a more effectual manner. Many of our farmers are now importing the very finest class of animals from abroad. This entails great trouble and expense, one tithe of which will not be met by the indemnity usually afforded for the damage of dog visitations.

The same cry is heard from our neighbors across the lines, and there they have been trying experiments manifold to stop the thing effectually. One man in Tennessee adopted the carcase-poisoning system—that is, when a sheep was killed, he generally saturated its body with strychnine, left it lying, and removed the rest of his flock to another field. This plan he stuck to heroically for six years, with the result that he lessened very materially the percentage of destruction, and destroyed as he alleges over one hundred dogs.

How would some regulation like this work?—

1st. That no dog should be permitted to be kept by anybody in any township, without a license from the Township Council—and that before the issuing of such license, the Council should be satisfied that the dog was a safe animal and his existence necessary to his owner.

2d. That every such dog should carry a collar with the name and address of his owner clearly stated upon it.

3d That any dog found in the Township not so licensed, or not having such a collar, should be liable to be killed at any moment by any one—and that a handsome reward be paid from the Township funds for every unlicensed or uncollared dog brought to the Pathmaster or other officer, and proved to have been killed within the Township.

4th. That the Dog-tax be largely increased.

Land and other Measurements.

How often we hear a farmer say, "this is a ten-acre field, this an eight-acre," and so on, without being able to give one good reason for his assertion other than that derived from comparison "Neighbor Jones' field"—as he says—"contains ten acres, and mine is the same size as his," but alas! neighbor Jones is as devoid of a sound basis for his belief as neighbor Brown, and so on to the end of the chapter.

Now this is certainly not as it should be. Whatever is worth doing is worth doing well, even to the measuring of an empty barn-yard, and much more so, when reference is had to the more profitable productive areas, the correct details of which furnish each individual farmer with his annual balance sheet, whilst the correct aggregate of such details affords the only true account of our agricultural resources as a country.

We propose in this paper to show how simply most measurements can be made. Generally speaking our fields are four-sided, and our field-fences straight or very nearly so. In mathematical language they would therefore be called rectilineal (straight-lined) quadrilateral (four-sided) figures. Now there are in all but six kinds of rectilineal quadrilaterals: 1st the square which has equal sides and angles or corners; 2nd, the rectangle or oblong which differs from the square only in being longer than it is broad; 3rd, the rhombus, having all its sides equal but not its angles; 4th, the rhomboid which is simply a lengthened rhombus; 5th, the trapezoid which has only one pair of its opposite sides parallel; and 6th, the trapezium which embraces all four-sided rectilineal figures not included under either of the other five heads.

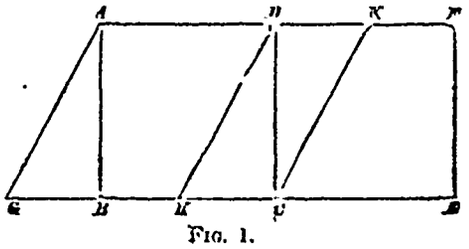


FIG. 1.

The accompanying cuts will simply and fully illustrate our definitions. In Fig. 1, *A B C D* is a square; *A B E F* a rectangle or oblong; *A G H D* a rhombus; *A G C K* a rhomboid; and the whole figure *A G E F* a trapezoid.

In Fig. 2, *L M N P* on the other hand is a trapezium because it has no resemblance to either of the other five. Now for the measurements. All necessary instruments are a nine-feet pole or a tape-line, and a home made quadrant. The latter is made thus:—take a square or circular piece of inch board—hard-wood is best—about a foot through, and make two saw grooves about ¼ or ½ inch deep on one of its surfaces, at *right angles* to each other. Clean out the grooves well, so that by applying the eye to one end of either of them you can see clearly through its whole length. Fasten the board thus prepared, horizontally, on a four-feet pole with sharp lower end, and the thing is complete.

To measure a square field or a rectangular one, you need only the pole or tape line. In the one case take the length of the side in yards and multiply it by itself; in the other take the length and breadth and multiply them together, and then in both cases divide the result by 4840 (the number of square yards in an acre) and you will have the exact area of your field.

To measure a rhombus or rhomboidal field; first take the pole or line and measure, in the case of the Rhombus, either side (for they are all equal), and in the other the longest side, in yards, next take your quadrant and stick it into the ground along one of the measured sides, arranging it so that one of the grooves may be exactly in line with that side; leave it in that position until you have stepped around it and looked through the other groove towards the opposite side or fence; mark the spot on which your eye rests: measure from the quadrant to that spot, also in yards; multiply the measured side by this new line, and as in the case of the square, divide the product by 4840.

To measure the Trapezoid: take the lengths of *both parallel* sides, add them and take half—thus getting the mean or average length, which multiply by the perpendicular distance between them, found by means of your quadrant as in the rhombus—and divide as before by 4840.

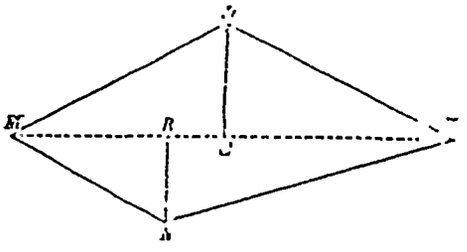


FIG. 2.

To measure the trapezium, which is on the whole the most general form of a field, let us refer for a moment to the diagram (Fig. 2). First measure the distance in yards between the two corners or angles which are furthest apart, viz.: *M* and *P*. Such a line is called the diagonal. Next walk along the diagonal with your quadrant and fix it at a point *S* in that line so that one of the grooves will correspond with the line (diagonal) and the other point directly at the angle *L*, measure the distance between *S* and *L*; move along again to the point *R*, and arrange your grooves to correspond with *M P* and *R N*; measure *R N*; add it to the length of *S L*; take half the sum; multiply by the diagonal *m p* and again divide by 4840.

Remember to take all your measurements in yards or of course you will have to change your divisor. If you have them in feet, for instance, you must divide not by 4840 but by 43560, or if in perches, then by 160, and so on.

Remember also that you do not mix matters by multiplying or adding feet and yards or feet and perches, or any two different denominations together; but in whatever denomination you take one measurement, take all the others in the same. The rule for the trapezium is correctly applicable to all the other figures mentioned, and wherever there is any doubt as to the proper name of a field from its shape, it is always safest to treat it as a trapezium.

All the rules here given are exceedingly simple and may be thoroughly mastered by any one familiar with the first four rules of common arithmetic; and yet they will prove so far as they go quite sufficient, with the aid of a little shrewdness in their application for all practical purposes.

In a future paper we will have something to say on five and more sided figures, circular figures, &c., &c.

A CORN ACCOUNT.—Stephen Holt, of Epping, N. H., gives the following certified statement of his experience in growing this crop the past year:

Hills to an acre	4,000
Bushels of ears	134
Ears to a bushel	103
Weight of ½ bushels of ears	24½ lbs.
Weight of kernels on the same	16 lbs.
Weight of cobs	6½ lbs.
Average ears to a stock on the piece	1¾

Woods and Forests.

Considering the vast importance of the preservation of belts of timber throughout our country, it is a matter of the deepest regret that *Legislative action* has not long since secured for us an intelligent and careful timber policy, one of the objects of which would have been in the laying out of new townships to provide for the establishment of Government Reserves of timber land, which should be maintained permanently under official supervisions. Everything has, on the contrary, been left to the tender mercies of the settlers, and the consequence is now seen and felt in the older townships in the complete denudation of the timber. Districts that were formerly covered with the best kind of timber, such as pine, walnut, oak, elm, beech, and maple, have been cut down and *burned* indiscriminately by the settlers in their haste to clear their farms; and thus millions of cubic feet of timber have been destroyed which, under a better system, might have been preserved, and would now have been mines of wealth.

Petitions, bearing on the subject, have at times been presented to our Legislative bodies asking them to take action against this useless waste but the subject, so far, has been treated almost with indifference.

We hesitate not to say that a system of reserves of timber, under official supervision, might be established, of incalculable benefit to the country in the way of shelter and effects upon climate, and which might be maintained, not without expense, but at a profit to the Government by the sale of timber which might be annually thinned with benefit to the remaining trees.

Germany, very many years ago, recognized the importance of such reserve and *acted on it*. There the Government, with a far-sightedness and intelligence worthy of admiration, laid out immense reserves throughout the whole country, and so careful are they of these forests, that it is a crime for any one to cut even a sapling. Nearly every Collegiate Institute, moreover, has a grant of timber-land ceded to it by the Government; and aboriculture is taught in these schools, and a knowledge of the use to which the various woods are applied. In the United States strenuous efforts are now being made to remedy the evils caused by the removal of the forests; and large expenditure is being incurred to re-clothe the face of the country with trees. So far is this carried that steps have been taken to plant great belts of young seedling forest trees upon the prairies where, in the knowledge of man, forests have never had a habitation. Aid and encouragement too is being given to planting in every direction by State and Municipal Governments, by railways, horticultural and agricultural societies, and by private means.

Why should Canada refuse to profit by her own experience and the experience of the nations and remain behind hand in this good work? Is her Government so imburied with the spirit of Vandalism, that, without making any provisions for the future, it *must* sell every Forest within her boundaries, this risking her prosperity to put a few more dollars in the public chest? The Almighty deals with nations as with individuals. He *helps those who help themselves.*

The policy of our Government with regard to Woods and Forests seem to be simply to sell as many timber limits as possible, as quickly as possible and with as little restraint as possible upon the operations of the Lumberman. The annual destruction of timber is far beyond what the general public have any conception of. And it is not only by the axe that the work goes on, for the destruction by *fire* is of even greater extent. In the operations of the Lumberman the *first choice* only is taken, but close upon his footsteps, with a surprising certainty, fire, follows, and the work of desolation is complete.

When we look at the timber trade aloud and consider that the demand is from year to year greatly on the increase, that an increasing number of trees is being annually felled to meet the increased demand, when we know our Forests are rapidly being cultivated farms and prosperous villages, who can fail to be grieved by the reflection that no provision is being made for a removal of the supply. In addition to reserves of Forest Lands Government measures should be established where the seeds of the pine and valuable kinds of hardwood could be sown and properly cared for. The Government have any amount of suitable land at their command and the sooner it is set about the better for it takes many years of undisturbed growth for the timber to reach the necessary size and perfection and the benefits to the surrounding country, properly appreciated.

The whole cost of these salutary measures would not be burdensome to the country and the benefits to be derived ere many years elapse would be beyond calculation.

Improvement of Meadows.

(Written for the CANADA FARMER.)

It is very frequently the case, that some other means must be provided for the maintenance of the fertility of meadows, than the cultivation of other crops. The reason of this is that some fields are so situated that it is extremely difficult to put them under the plough, much more to cultivate a general crop. And yet, when once sodded down, they make excellent meadows, hence the necessity of occasional renewal by some system of fertilizing. Much can be done in this direction, when the conditions are all right, by means of irrigation by permanent streams of water. Very many of the elements necessary to plant growth, are held in solution in creek water and hence are taken up by the roots of the plants, there is also very much sedimentary matter that is carried along and deposited about the roots of the plant in the best possible condition for use. But in the first place, in order to derive benefit by this means, the meadow must be so situated, that the water may be spread evenly over its entire surface, which makes it necessary that the stream should have sufficient elevation to admit of its being tapped, and so drawn down upon the meadow. Again, the soil must naturally be loose and porous, capable of absorbing a good proportion of the water, still allowing it to pass off without injury to the growing crop from stagnation; or, if this is not the case, the field must be thoroughly underdrained to carry off the surface water, otherwise great injury will result. Irrigation seems to be an effectual means afforded by nature for increasing the fertility of our fields. It is to be regretted, however, that while the means are so effectual, they are not always available, and therefore mankind are compelled to employ other expedients. Top dressing, or a surface application of fertilizers, is one of these. In order to obtain the best results this should be done as evenly as possible. Sometimes artificial irrigation may be practised with much success, especially where conveniences are at hand for solving and applying the liquid portions of manure. It is sufficiently established, that the manurial value of the urine of animals is very large in the course of the year, and that it is in just the state to be assimilated by the plant, hence, any application of that, will be immediately productive of important results. This is perfectly illustrated in the application of liquid to house plants in window gardening. But liquid manure is not always at hand, and then other kinds must be brought into requisition. Commercial manures are very effectual, for the reason that considerable portions are in a condition to be immediately used. One thing is certain in regard to grass as in regard to crop, the more finely pulverized and consequently more soluble the materials used, the more immediate the results; and although the effects may not prove as lasting, as in some other cases, they are fully equal. On some kinds of soil, that are inclined to cold and moisture, coarse horse manure is spread with very great advantage; so, too, other applications must be made to suit the peculiar conditions of the soil upon which the application is to be made. This is a matter that must be determined by each farmer for himself; and to judge correctly, he should be well acquainted with the character and wants of his farm. As to the time of making the application of fertilizers, there is considerable diversity of opinion. It may be done in the spring or in the fall, in either case, it will depend upon circumstances, but it should be so made as to retain all the value of the fertilizing material, allowing none to be lost; hence if an application is to be made after one crop is removed, as recommended by some, it should, if possible, be made previous to a shower of rain, so as to be carried directly into the soil, but upon all these points the judgment of the intelligent farmer will be a sufficient guide.—WILLIAM H. YEOMANS, COLUMBIA, CONN., MAY, 1873.

The Japan Quince.

This blossoming shrub has been glorious with its bright scarlet blossoms all through the early spring, and has well established a claim to the attention of those who care for their home surroundings enough to bestow a little thought upon the selection and planting of those trees and shrubs which will give them a cheerful and attractive appearance. In all the range of flowering shrubs, as yet introduced, which are suitable to our climate, there is none to equal it in splendor when in bloom. Grown as a single shrub upon the lawn it is most attractive, and such is the brightness of its flowers, which open in clusters along the branches and shine out from among the young leaves scarce yet unfolded, that it has received the common name of the Burning Bush.

But it is when grown as a hedge or screen that its beauty is fully brought out. Fortunately the plants bloom when they are quite small, so that in a year or two after planting one has the pleasure of enjoying in some degree the fruit of his labor. But as soon as the screen has attained the height of three and four feet, it becomes a most brilliant object. Like a wall of fire, blazing brightest in the mid-day sun, it shines out in the early spring-time, giving a glow of warmth and beauty to the grounds, even before the chill winds have wholly disappeared.

This shrub is a native of Japan, from whence we have received already a number of most interesting and beautiful additions to our hardy plants. There are several varieties now in cultivation besides the scarlet flowered, to which we have referred. One of these produces flowers having a delicate pink blush, another has dark crimson blossoms. The variety known as Princess Emile Soutega, has dark blood-red flowers, and Umbelicata has brilliant rosy-red flowers, and large showy fruit.

All of these several kinds have bright glossy-green leaves, so that they are pleasing objects even when out of bloom. They are also of easy culture, growing readily in any good garden soil, yet preferring a well drained clay, in which they grow with surprising vigor, and bloom with great profusion. Nor are these plants scarce and high priced. Any of our nurserymen will supply single plants of one or all of these varieties for fifty cents a piece, and small plants for hedges or screens, can be purchased by the hundred or thousand at very low rates. So showy and hardy a shrub, of such easy culture, and so readily and cheaply procured should be found in many gardens and grounds, that would be made much more bright and gay than they now are, by a judicious planting of some of its varieties.

Early Oats.

Our experience on the farm is that the early sowed crops are, as a general rule, the best. We found that the sooner the oats were put in the ground the better crop we harvested in the fall. This was not only the case in regard to ourselves, but with all of our neighbors. Early sowed oats will not only yield better, but weigh more to the bushel than those sowed late.—*Cor. Farmers' Union.*

Treatment of Hams.

To preserve hams through the summer make a number of cotton bags, a little larger than your hams. After the hams are well smoked, place them in the bags, and get the best kind of sweet, well made hay; cut it with a knife, and with your hands press it well around the hams in the bags; tie the bags with strings, put on a card of the year, to show their age, and hang them up in a garret or some dry room, and they will last five years, and will be better for boiling than the day you hung them up. This method costs but little, and the bags will last forty years. No flies or bugs will trouble the hams if the hay is well pressed around them; the sweating of hams will be taken up by the hay, and it will impart a fine flavor to the hams. The hams should be treated in this way before the hot weather sets in.—*Ex.*

The Healthfulness of Lemons.

When people feel the need of an acid, if they would let vinegar alone, and use lemons or apples, they would feel just as well satisfied and receive no injury. A suggestion may not come amiss as to a good plan, when lemons are cheap in the market. A person should then purchase several dozen at once, and prepare them for use in the warm, weak days of the spring and summer, when acids, especially citric and malic, or the acid of lemons, are so grateful and useful. Press your hand on the lemon and roll it back and forth briskly on the table to make it squeeze more easily; then press the juice into a bowl or tumbler—never into a tin; strain out all the seeds, as they give a bad taste. Remove all the pulp from the peels, and boil in water—a pint for a dozen pulps, to extract the acid. A few minutes boiling is enough; then strain the water with the juice of the lemons; put a pound of white sugar to a pint of the juice, boil ten minutes, bottle it, and your lemonade is ready. Put a tablespoonful or two of this lemon syrup in a glass of water and have a cooling, healthful drink.—*Farmer's Union.*

A Flower Sermon.

On Tuesday evening the church of St. Catherine Cree was one of the sights of London, as, indeed, it always is on Whitsun Tuesday, that being the day upon which the anniversary Floral Sermon is preached there for the edification of young children. The congregation, principally children and women, wore either a posy pinned in the breast, or held a nosegay in their hands, as a befitting decoration for a floral sermon. The appearance of the inside of the church was very beautiful. On the pulpit was a bouquet exhibiting great taste in construction, at which many stolen glances were cast by the fairer portion of the congregation. This triumph of floral grouping was, as the preacher informed us, the present of a young lady, who had presented a similar one to him every year since he first preached a sermon upon flowers. For the happy idea of having an annual Flower Sermon preached at Whitsuntide we are indebted to the Rev. Dr. Whittemore, who preached an eloquent sermon, couched in plain language, and well adapted to the comprehension of his juvenile auditors.—*The Garden.*

Grind Your Corn.

Corn is one of the most useful grains that is raised. Everything, from the duck up to the sturdy ox, will eat, thrive and do well on corn. In the south it is used largely for bread; in the east, it is used as manure for tobacco; in the west it burned for fuel. The object of this line is not to teach men how to raise corn but how to feed it out to advantage. If corn be fed to stock in the ear, one third of it is lost and some claim more. Corn to fatten any animal needs to be ground. No doubt many farmers would grind their corn if they knew how to get at it. And now I will tell you how. Let enough men club together to buy a steam engine and mill.

Cost of engine will be	$300
Cost of 5 inch iron mill	35
Cost of Sheller	30

This engine will run mill and sheller all the time'

and will grind from ten to twenty bushels per hour, according to the power applied. The cobs will furnish all the fuel after the first five bushels. This engine will be of the portable order, with railroad boiler, will be a complete thing by itself, all ready for the belt and will be warranted by the maker to grind and shell together.—*Prairie Farmer.*

A Word to Farmers' Boys.

We hope every farmer's son will set out, at least, one ornamental tree on the homestead this spring. It will be one of the first things he will look at when he returns home at some future time. We always search out the apple trees that we raised from the seed, large venerable looking trees, and derive a peculiar pleasure as they help the memory to run back to the scenes and pleasure of boyhood. To-day we saw a beautiful maple that we set out twenty-six years ago. Go and get a healthy looking sugar maple, with as many roots as possible. Cut the top off, but leave the small underbranches. Set it out before the buds begin to swell, in a rich soil, and it will grow and be an ornament to your home. Almost every boy is anxious for the time to come when he shall go away from home and see the world for himself, but after he has been bruised about a few years, he turns his eyes towards the home of his boyhood where every object has a peculiar interest, and if he can see a beautiful tree that his own hands planted, it will add much to his pleasure. Parents are often advised to make home attractive to their boys, but boys can do much themselves to make it pleasant by planting trees. We hope that when we ride by your home, we shall see some trees planted by your own hands. —*Maine Farmer.*

Charlock.

This is a terrible weed-pest to farmers on cultivated grounds, like all plants producing oleiferous seed exhausting the soil, and the seeds as they drop, are buried in the soil and retain their vegetative qualities for an unknown length of time, so that when once thoroughly introduced into a field it is almost impossible to eradicate it therefrom. It is a native of Old England and thoroughly naturalized in New England and New York on the farms of slovenly farmers. We knew no way to get rid of it, but to keep down the ground where introduced to grass. We well remember a field that we observed in boyhood that had been seeded down to grass, mowed and pastured or many years, during which not a plant was seen unless the turf was broken, when ploughed for a crop of rye, came up thick with charlock. It resembles mustard. Let every farmer whose fields are clear of it take good care and not suffer it to be introduced. We have seen far miscontiguous, one entirely clear from it and the other's tilled fields when sown with spring grain, yellow with it. Never sow grain, grass or clover seed grown on farms infested with charlock, or wild-turnip as some call it, as it is of the Brassica family of plants.—*Boston Cultivator.*

How to Get Along.

Do not stop to tell stories during business hours.

If you have a place of business, be found there when wanted.

No man can get rich by sitting around stores and saloons.

"Never fool" in business matters.

Have order system, regularity, liberality and promptness.

Do not meddle with business you know nothing at all about.

Never buy an article you do not need, simply because it is cheap, and the man who sells it will take it out in trade.

Trade in money.

Try to avoid hard words and personalities.

Do not kick every stone in the path. More miles can be made in a day by going steadily on than by stopping.

Pay as you go.

A man of honor respects his word as his bond.

Aid, but never beg.

Help others when you can, but never give what you cannot afford, simply because it is fashionable.

Learn to say "no." No necessity of snapping it out dog fashion, but say it firmly and respectfully.

Have but few confidants, the fewer the better.

Use your own brains rather than those of others.

Learn to think and act for yourself.

Be vigilant.

Keep ahead rather than behind the times.

Reader, cut out this, and if there be any folly in the argument, let us know.

Farmers Grind Your Own Grain.

This is the advice the *Live Stock Journal* gives in the following language: "In a large experiment of feeding 6,000 horses, by the London Omnibus Company, it was found to take six pounds of grain less per day when ground than when unground. Every large farmer should have enough power to grind his own grain; and for this power he has abundant use in threshing, cutting hay, straw and stalks, sawing wood and many other classes of work. It will take him no longer to grind at home the grain he feeds than to take it to the mill two, three or more miles; and, besides grinding it to suit himself, he can save the toll, which sometimes reduces the quantity more than the value of grinding. But when the farmer decides to grind his own grain, let him purchase a small burr mill instead of an iron mill, which does not, in fact, grind, but only splits or fractures the grain into small angular pieces—does not pulverize. There is nothing but a burr mill-stone that will really grind the farmer's grain as economy requires. It costs but a trifle more to purchase a small burr mill, large enough for a common stock, than an iron mill, and the increased value of the feed for one year would more than make up the difference. These mills are now made so simple that any farmer can run them, and the repairs will cost no more than those of iron.

To Fence Against Floods.

Take two short, heavy posts, say three feet long, set into the ground and extending above it some ten or twelve inches. A pole six inches in diameter and of a sufficient length to span the stream, or if for a meadow twelve to fourteen feet long, forms the bottom rail of the fence. This should be cut flat on one side and the ends rounded down to about two inches, so as to fit into corresponding holes in the before mentioned posts about six inches from the ground. A board, or a flat rail the length of the panel, forms the top rail, and to this and to the flattened side of the pole are to be nailed uprights at a distance proper to oppose the stock intended to pasture on the land—these to be nailed on the up-stream side.

The panel is now made, and is to be fixed upright by forcing the lower or down-stream side with poles set slantingly for the purpose, and abutting against the top rail of the panel to which this should be nailed. When during a freshet the water presses against the fence, the props give way and the panes falls down with the ends or edges of the board presented to the line of the current and offer but little resistance to it. When the storm or flood is over, all that is necessary is to go to work, and after raising it up, prop it as before, and it is as good as ever.

We have seen this fence and are told that it answers all the purposes desired.—*Germantown Telegraph.*

A Cheap and Excellent Fly-Trap.—Now that the hot weather approaches, the following method of trapping flies, as practised and indorsed by a correspondent of an Irish agricultural paper, will be found useful: A common glass cover, or bell-glass, is the instrument to be used; this has to be tightly covered at the bottom with thick white paper. A circular hole, 6½ inches in diameter, is then cut in the centre of the paper, and the glass is placed on three bricks over a plate filled with beer, sugar and a little rum, a moderate distance from the infested spot. The effect is magical; in a few hours the glass is crammed with flies, which having tasted the sweet, fly upward to the light. A common sulphur match, made by dipping brown paper into brimstone, will destroy thousands. The constant hum of insect life will attract all to the glass, and the scent of the rum is sure to induce the most fastidious wasp to enter, as no insect can resist its powerful attraction.

Value of Night Soil.—Liebig relates that in the fortress of Rastadt and in the soldiers's barracks of Baden, generally, the privies are so constructed that the seats open; through wide funnels, into casks fixed upon carts. By this means the whole of the excrement, both fluid and solid, is collected without the least loss. When the casks are full they are replaced by empty ones. The farmers about Rastadt and other garrison towns having found out by experience the powerful fertilizing effects of these excrements upon their fields, now pay for every full cask a certain sum (still rising in price every year,) which not only has long since repaid the original outlay, beside covering the annual cost of maintenance, repairs, &c., but actually leaves a handsome profit to the department. The results brought about in these districts are highly interesting. Sandy wastes, more particularly in the vicinity of Rastadt and Carlsruhe, have been turned into smiling cornfields of great fertility.

The bark louse may be cleaned from the apple or pear tree by washing, any time previous to the opening of the blossom buds, with a moderately strong lye of wood ashes. Some use caustic lime mingled, others use sulphur and soot, and some copperas and salt; but simple wood ash lye is as effective as anything and attainable by all.

Egg-Eating Dogs.—"W. C. G.," of Boston, suggests a specific for egg-eating dogs, viz.: "Blow an ordinary hen's egg, expelling the entire contents, stop up one end with wax. Then fill it from the other end with strong spirits of ammonia, or 'Hartshorn' Seal that end and then put it where the dog can get it. If he crushes it, he will never be desirous of repeating the luxury of egg-eating. After the dog has had one ammoniacal feast, a little of the fluid poured into the nest, will remind him of the fact, that he once was burnt, and also serve to cleanse the nest from vermin."

Profits of Timothy Seed.—A correspondent of the Detroit *Free Press* writes: Last season we saved about five acres of grass for seed. Some of our neighbors laughed at us—they said we were foolish when hay was so high. But we made almost double what we would if we had cut it for the hay. There would not have been over four tons at the most, and the hay would have fetched $16 a ton, which would have been $64 for the hay. Well, there were two tons of straw, which brought $12 50 per ton—$25 for the straw; there were twenty-four bushels of seed, which brought $3 50 per bushel—$84 for the seed; add $25, which would be $109. Now subtract $3 for threshing, which would leave $106, and you see there was $42 more profit on the seed than there would have been on the hay.

The Potato to be Superseded.—In Germany there exists a decided prejudice against potatoes, because they are composed of three-fourths water, with but 10 or 15 per cent. starch contained in indigestible cells. The French, who make a perfect science of the whole business of nourishment and cookery, rarely eat potatoes except occasionally fried for the second breakfast. They consume beans more than any other vegetables, and with reason, for dried beans contain 22 per cent. albumen and 56 of starch, and the common lentils 26 per cent. of albumen and 56 of starch, and the common lentils 26 per cent. of albumen and 56 of starch. In the monasteries of France and Italy great quantities of beans are used, especially during the lenten season. German naturalists are now searching all over the world for a substitute for potatoes, and this is believed to have been found in China in the dioscrea japonica, which endures the greatest cold, and is more nourishing and better flavored than the potatoe. In the museum of natural history at Paris, a specimen, three feet long, and weighing three pounds, was exhibited.—*Utica Herald.*

Cultivation of Orchards.—The *Gardeners' Monthly* contains an account of two orchards in the same neighborhood, near Buffalo, which have received opposite treatment. One had been plowed while the trees were small, and afterwards seeded to grass—and annually top-dressed with compost or stable manure. The other orchard was kept in a condition of the highest culture, with vegetables grown between the trees. The orchard in grass gives an abundance of good fruit, while the one highly cultivated bears but little. The inference is that grass is better for orchards than high cultivation. But a simple statement of this sort is of no value whatever, without information as to the circumstances which control the growth of the trees. Nothing is said about the length of the annual shoots in either case, and we would otherwise know whether the trees grow too fast or too feebly. If the annual manuring on the grass gives a yearly growth of two or three feet, that is enough, and it would be detrimental to give higher culture, as appears to have been the case with the cultivated orchard. But if an orchard with free cultivation does not give shoots a foot long, it would be destructive to lay it down to grass, especially, as is commonly the case, no manuring whatever is applied. To give general rules without any modifying conditions partakes of the character of quackery, and would be like presenting food for a sick person without knowing whether he already suffered from plethora or starvation.—*Express.*

Animals in the hurry of a busy season are apt to be neglected. Do not fall into this error. The success of a good farmer depends more on his skill and judgment of his live stock than on the mere raising of crops.

The Dairy.

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

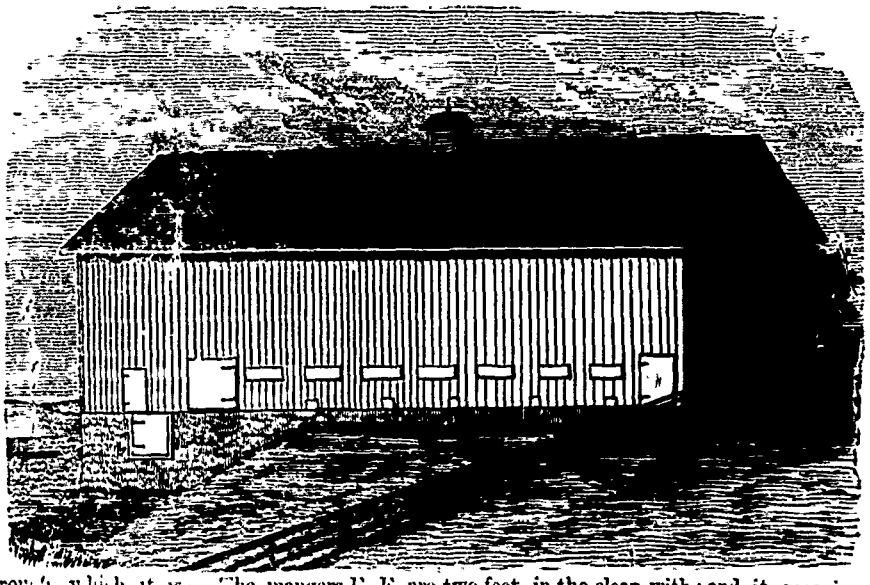
The Dairy Barn.

A dairy barn should be so constructed as to be convenient for the herds-man, saving time and labor in the care of stock; it should provide for the comfort and health of the herd; it should afford ample space for storing provender; it should be a comfortable, convenient and cleanly milking barn; and last but not least it should be conveniently arranged for disposing of and protecting the manure.

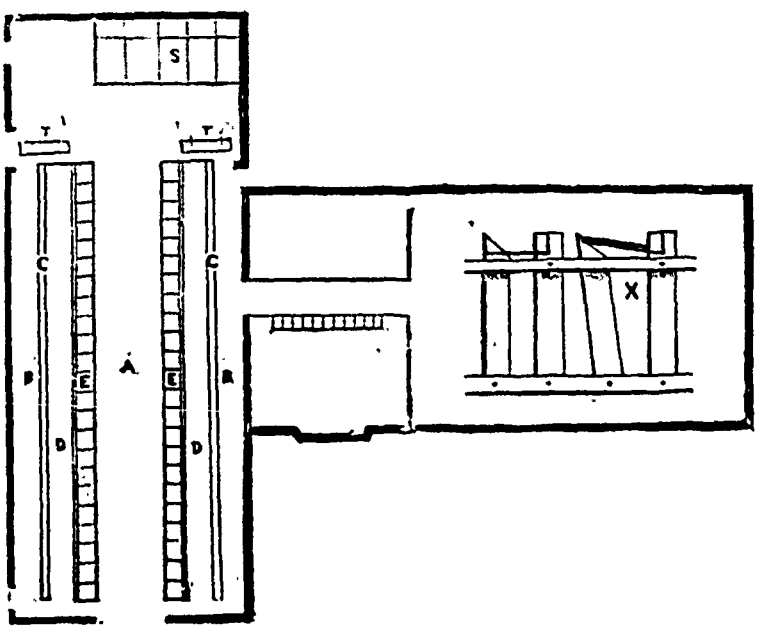
These points have been well provided for in the plan here illustrated taken from the barn of Peter Mulks, of Slaterville, N. Y. It is designed for the entire stock of cattle, and horses, and hay, and grain of a farm of 200 acres

It is 95 feet long by 38 feet wide with 25 feet posts, and has a wing 80 x 40, used as a grain barn, carriage house, and stables for horses.

The main part of the building, which is designed for the dairy, is what we wish more particularly to call attention to



This is located upon a moderate slope, the sides and one end resting upon a mason work. The building stands with its longest dimensions east and west, with the west and front end through which it is generally entered, facing the highway. Under the east end is an excavation extending under the building 24 feet and walled up on three sides, the east end being left open. It forms a space 24 feet long by 38 wide and 10 or 12 feet deep, which is used as a manure shed. Under the remainder of the building the ground is levelled up with gravelly loam to the top of the wall, so that the main floor, A, in the centre, lies flat upon the ground instead of on timbers as is usual. The original design embraces a root cellar under a part of this floor.



The internal arrangements will be understood by referring to the ground plan. The stables occupy 72 feet of the front end of the barn, and are located on each side of the main floor with the heads of the cows facing each other. Behind them is a floor B. B. five feet wide with an inclination of two inches toward the cows. Next to this is a gutter 10 inches wide and 4 deep, made of 2 inch plank, very firm and tight. Next to this is the space D. D. on which the cows stand, sloping two inches toward the gutter. This space of 4 feet and 4 inches from the gutter to the bed piece which holds the stanchion, has no floor. The cows stand on a bed of gravelly loam, which has been pounded down and made firm and smooth. Mr. Mulks regards this as much better and more comfortable for the cattle than a wooden floor

The stanchions allow three feet to each cow They are built in the usual way except the mode of fastening which is the simplest and safest we have ever met with This fastening consists simply of a loop of three-eights round iron, wide enough to let the ends of the upright pieces pass through it readily, and just long enough to drop over the movable upright and hold it in its place, the other end being dropped into a slot in the permanent upright, where it is made fast by filling up the slot after the loop has been dropped in. (See section of stanchion illustrated in the wing of the ground plan.) The upper end of the movable upright is made slanting so that the end of the loop slides upon it and falls astride of it when it gets to its place. Though in use several years a cow has never been known to get loose from this fastening. It is impossible for one to do so because the loop lies flat on the top of the horizontal piece which holds the uprights, and a cow cannot possibly reach it. We have used loops made of No. 6 iron wire, in the same way which have proved perfectly safe and satisfactory.

The mangers E. E. are two feet in the clear with the bottoms raised 4 inches above the feet of the cow. A separate feed-box is made for each cow. It is formed by boarding up in front 16 or 18 inches, and separating their heads with a partition of two inch plank. The part over the manure shed is fitted up with stalls for transient horses and places for keeping calves in the spring, or for absorbents as may be required.

One of the essential advantages of dairying over other modes of farming is the better means it affords for maintaining and improving the fertility of the farm. The extent to which the manure heap shall contribute to this end depends very much upon the arrangements of the dairy barn for taking care of the manure. If stables are placed in a lean-to on either side of the barn, as is frequently done, and the manure thrown out of windows under the eaves to be washed by the drippings of a wide roof, half the value of the manure will be lost by the waste of all the liquid excrement of the herd, and very likely, half the strength of the remainder will be steeped out and soaked into the ground where it is not needed, and the bulky remainder finally carried to the field worth only one quarter its original value—a minimum too small to maintain the fertility of the soil. A remedy has been sought in a manure cellar directly under the stable, into which everything is dropped through trap doors directly behind the cows. This makes a complete saving of all the manure, but the fumes from the fermenting mass in the cellar are constantly steaming up through every crevice and opening, and filling the room above with offensive air, unwholesome for the cows to breathe.

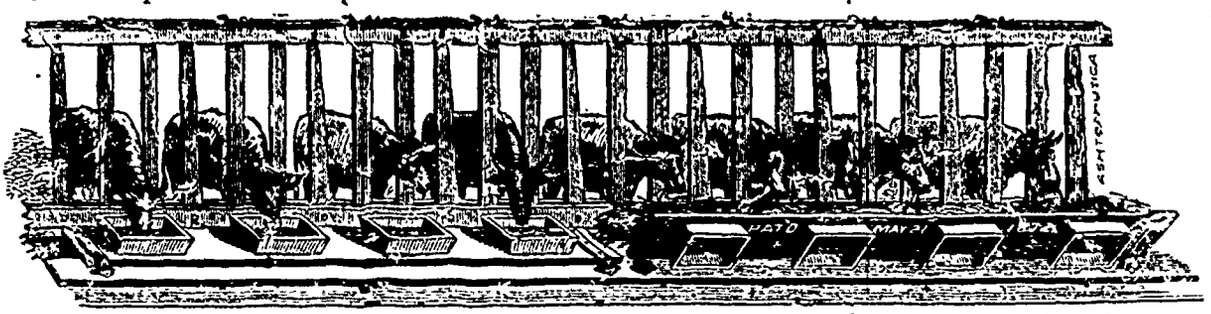
All these defects are obviated in the plan before us. The manure shed, instead of being under the stable, is at one end and entirely outside of it, and is effectually shut away from it It is open on one side so that all the effluvia that arises escapes into the atmosphere instead of being driven into the apartment above. It is at the same time perfectly protected from the weather. The gutter behind the cows and the whole stable inclines a few inches, making it easy to wheel the manure to the shed where it is dumped through the trap doors T. T. The saving of manure is complete, as all the liquid would find its way to shed by draining if not otherwise provided for. But bedding and absorbents are always supplied for taking it up and it goes in daily with the solids, Whenever necessary the gutter is rinsed out and the wash all goes into the shed and is saved. The droppings from the stalls, S, and from the horse stables in the wing are also daily mixed with that from the cows, improving the condition of both. One is prevented from heating too much and also acts as an absorbent, and the other from being too cold, wet and soggy.

The high posts make the left a capacious receptacle for fodder. It will easily hold 100 tons. The bents are 12 feet distant from each other and divide the whole into 8 equal parts. The timbers inside are arranged with a view to unloading with a horse fork, so that no beams are in the way. Beginning at the back side each division is filled separately and can be taken out separately if desired. As the filling progresses a scaffold is laid over the driving floor, A, of plank, the ends of which reach to the scaffolds over the stables and rest on 8 x 10 girts reaching from bent to bent.

This, when the barn is filled, forms a complete covering over head, utilizing all the room for storage and making the stables warmer in the winter by preventing a too ready escape of the heat radiating from the cows. With the recent improvements in railway forks, such a barn could be filled by driving up to the front end and taking the hay in through elevated doors and carrying it back, where ever desired, on an elevated railway. Or the hay could be taken just within the front doors and elevated and carried back from there easier than to drive in and back out through so long a distance, and save also the labor of moving and replacing the scaffold over the floor.

Bins for holding feed are placed in the front end of the second story. The feed is elevated with a hoisting apparatus, and spouted down as wanted. The feeding and foddering is all done in the barn, and the arrangements for doing it are very convenient.

The milking is also always done in the barn, and for this purpose it is located convenient to the dairy-house and dwelling, which are combined. Convenience and comfort in milking are important considerations, and they have been well provided for. It is warm and comfortable in winter. The sides of the barn are boarded up with matched stuff and battened, the doors and windows are all snugly fitted, leaving no gaps for cold winds to rush in; the cows stand upon the ground and the floor lies upon the ground, giving no chance for wintry currents to drive under and crowd up through cracks to reduce the temperature inside to a level with that outside. The stables never freeze.



In the summer it is cool and airy. The stables contain 46 stanchions while the number of cows milked is usually about 30, so that there is no sweltering heat from cows being crowded together too closely. Ventilation is easy and ample. Besides the admission of air through the doors, there are large wickets in the sides of the barn above and behind the cows, as shown in the elevation, and directly behind each fourth cow is a small door 30 inches square, opening down to the stable floor. These little doors are a happy arrangement. While the warm air passes out through the wickets above, the opening of these doors never fails to let in a current of fresh air that strikes directly upon each cow, and is enjoyed alike by the cow and her milker.

The cost of the barn and wing was about $6,000. The main barn cost something over half this sum. As the parts were built together, a separate account of each was not kept. Parties desiring to build with less expense could somewhat shorten the length of the stables for the number of cows, and build a cheaper manure shed. Four feet could be saved in the width of the barn by adopting the combined manger and feed box, recently invented by Harris Brothers of Newport, N. Y., of which we give an illustration. This arrangement, which turns up for a manger, and down for a feed-box, as the illustration will show, is hung on hinges from which it can be slipped off in divisions, and put aside when the room is wanted for a drive-way or other purpose. The wing will not generally be needed for a dairy-barn, as the accommodations it affords are usually found in other buildings, which in Mr. M's case had been swept away by fire. A nice and substantial barn, capable of accommodating 30 cows, could now be built for $3,000 or probably less.

Cheese Factory Facts.

In answer to inquiries X. A. Willard gives, in the *Rural New Yorker*, the following condensed summary of facts, which will answer many questions in the minds of those not familiar with the business. Mr. Willard says:—

1. A building 75 feet long by 32 feet wide and two storeys high will be large enough to accomodate the milk of 400 cows. The storeys should be each from eight to nine feet high in the clear. A hard, dry, airy location should be selected, with sufficient descent in the rear of the building to insure the escape of decomposing slops to a safe distance. The length of the manufacturing and press-room will be about 35 feet. It should be separated from the curing-room (lower storey) by a tight double partition, with a large sliding door in the centre between the two lines of presses. A boiler-room and a wood or coal-room will be erected at the end adjoining the manufacturing-room, with a door between the two. In front of the manufacturing department, and connected with it, there should be a building for a drive-way and receiving platform, where the teams can deliver the milk under cover.

Cheese factories in New York are usually built of wood and cost all the way from $3,000 to $8,000, or more, according to size and finish. The apparatus, including steam boiler, vats, &c., for furnishing a factory the size named will not be far from $800.

2. The average quantity of cheese per cow for the season at the New York factories is about 400 pounds. Sometimes an average of 500 pounds is reached. The season of factory work ranges from seven to nine months. Only a few are kept open in winter and then cheese is made at intervals of several days, or according to the quantity of milk furnished. At 400 cows, averaging 400 pounds each, the quantity for the season would be 160,000 pounds. From $1.60 to $2 per 100 pounds is charged for manufacturing cheese and fitting it for market.

3. Factories in New York, market cheese when it is 30 to 40 days old. The price per pound varies in different localities and from year to year, say from 12c. to 15c for shipping. Where there is a good home market better prices are not unfrequently obtained. Like all other products, the price is governed by the supply and demand and the quality of the goods.

4. The whey from the milk of five to six cows is usually considered sufficient for the keep of one hog, but it is advisable to feed meal of some kind in the whey.

5. In old times cheese was sent to market in barrels. These are now out of date and boxes universally employed for packing. The cost of boxes varies in different localities, but perhaps a little less than half a cent per pound of the cheese would be the average expense for packages.

6. Good cheese makers can be had for from $75 to $100 per month and board during the cheese making season of eight to nine months. With a good manager the other help about the factory may be the ordinary hands of the country.

7. The profit realized per cow will depend upon the price received for the cheese and the quantity made. If 400 pounds be taken as the average product, and the cheese sells for 14c., the profits per cow may be easily calculated.

8. The time for having the milk all in at the factory is generally regulated by the factory managers, from seven to eight and even nine o'clock in the morning and the same in the evening, during the summer.

9. If milk is properly cooled and aerated at the farm it may be carted five miles to the factory and arrive in good condition—that is, on all ordinary roads of New York. It is carried in tin cans holding from 30 to 40 gallons.

10. A popular plan in New York is to erect the factory on the joint stock principle each person delivering milk taking shares. Sometimes a factory is built and owned by one or more persons who will purchase the milk and run the factory on their own account. In such cases the price of milk is regulated by the price of cheese. Thus, for instance, it takes 10 pounds of milk to make one of cheese, and the ten pounds of milk is worth the price of one pound of cheese less the cost of manufacturing and marketing, which is from two to three cents, according to localities and circumstances.

Brine for the Preservation of Butter.

To three gallons of brine strong enough to bear an egg, add a quarter of a pound of nice white sugar, and one tablespoonful of saltpetre. Boil the brine, and when it is cold strain carefully. Make your butter into rolls, and wrap each roll separately in a white muslin cloth, tying up with string. Pack a large jar full, weight the butter down, and pour over the brine until all is submerged. This brine will keep really good butter for a whole year. Be careful not to put upon ice butter that you wish to keep for any length of time. In summer, when the heat will not admit of butter being made into rolls, pack closely in small jars, and, using the same brine, allow it to cover the butter to a depth of at least four inches. This excludes the air, and answers very nearly as well as the first method suggested.—*Hearth and Home.*

Improved Management of Cows.

Mr. G. C. Bradley, an enterprising farmer of Jefferson Co., N. Y., discussed this question before his county Farmers' Club, lately, and drew a contrast between horses and cows in reference to profit, and found that horses were much better cared for, and produced less profit. He figures the expense of keeping a horse as follows.

137 bushels of oats at 50 cents	$68 50
6 570 pounds of hay at $15 per ton	48 27
Labor in taking care of a horse, 15c. per day	54 75
Interest on investment, say $200	14 00
Wear, risk and depreciation 10 per cent.	20 00
Interest on waggon, carriage, etc. ..	21 00
	$226,52
Making cost of a span of horses....	453,04

He thinks horses are not made to pay the cost of keeping them. The cow, he thinks, kept on the pinch and starve system, with a ton and a half of hay, and a little straw in the winter, will cost $22.50 for wintering and $13.00 for summering, making a year's keep $35.50, and that he will do well if he gets 300 pounds of cheese, which at twelve cents will bring $36.00, leaving a balance of fifty cents over keep. But when a good cow is fed liberally, it will cost $50.00 per year, and she will make 600 lbs. of cheese, which at present prices, sixteen cents, would bring $96.00, and leave a profit of $46.00, to cover labor, risk, etc. This average of 600 lbs. per cow has been reached by some of the best dairymen, and no one should be satisfied till he has reached it. He believes that it is cheaper to keep cows warm in good barns, than to warm them with food out of doors, and quotes Mr. Arnold, of Utica, N. Y., who says he has found by careful experiment that 200 lbs. of hay in a warm barn will go as far toward keeping stock as 300 lbs. in a barn full of cracks and openings, and that he tried it with ten cows in each case. He thinks the profits of the future depend mostly upon improved feeding in our dairies.—*Live Stock Journal.*

Cows are sociable, and understand more than we suppose. The way I came in possession of this choice bit of knowledge, Tim and I used to sing to our cows. They knew very quick when we changed from one tune to another. We have tried them repeatedly. When we sang sober church hymns, they'd lop their ears down, look serious and chew their cud very slowly, reminding me—no irreverence meditated—of nice old ladies in church, listening to the words of the preacher; yet all the while munching cloves. Then we'd change to some quick air, "Yankee Doodle" or the like, and they would shake their heads, open their eyes, blink at us as much as to say, "Stop, don't you know we are the Deacon's cows?" But when we would stop entirely, every cow would turn her head as if asking us to go on with our singing. If it was pleasant, we generally sang together through the entire milking. I love the dear animals that add so much to our comfort. What is better than sweet, golden butter, and nice rich cream? Boys, will you not be kind to the cows?—M. M.

Breeder and Grazier.

Short-Horn Intelligence.

A large number of auction sales of thorough-bred Short-horns have recently come off in the United States—and at nearly all of them very large prices have been realized.

At Mr. W. Stewart's sale in Illinois, 25 cows and heifers were sold at an average of $638, and 11 bulls at an average of $290 per head. Total amount realized for 36 Short-horns $19,140. The highest price obtained was for the five-year cow *2nd Lady of Pine* $1,600 The imported cow, *Violet 20th* brought $1,525, and *Magarka 20th*, $1,350. The highest price obtained for a bull was $1,000.

At Mr James H. Davis' sale at Danville, Kentucky, 24 female Short-horns were sold at an average of $304, and 3 bulls at an average of $217. Total amount realized for 27 animals $7,944. The highest price obtained was for the two-year old heifer *Medora 9th*, $715.

At the sale of Messrs. J. H. Spears & Sons, of Tallula, Ill., 34 cows and heifers were disposed of at an average of $371 47; and 26 bulls at an average of $256 35 per head. The total amount realized for 60 animals was $19,295. The highest price realized was for the three-year old cow *Sarah Rice*, and her bull calf by her side, $1,510 One yearling bull brought $800 and another $795.

At the sale of Mr. Edward Iles, Springfield, Ill., 29 cows and heifers were sold at an average of $874; and 8 bulls at an average of $1,071 per head. The total amount realized for 37 animals was the large sum of $33,931. The imported bull *Cherub* brought $6,000, and the buyers were Messrs. J. H. Spears & Son. The yearling bull *Dr. Buck* was bought by the same firm at $1,300. The cows and heifers sold were as follows:—

Gem 3rd, 10 years, C. C. Parks, Waukegan, Ill., $—.
Oxford's Gem, 3 years, $775.
Airdrie's Gem, 2 years, Elijah Iles, $860.
Cherub's Gem, 1 year, Sol Meredith & Son, $655.
Guilty, 9 years, Brown Sons, Berlin, Ill., $500.
Grace, 2 years, S. C. Duncan, Smithfield, Mo., $155.
Maid of Hope, 4 years, R. N. Priest, $755.
Maid of Charity, 2 years, Wm. Pritchett, $740
Imp. Lady Highthorne, 5 years, J. H Spears & Sons, $2,500.
Florence, 3 years, S. C. Duncan, $1,100.
Joan of Arc, 5 years, S. Meredith & Son, $2,000.
Anne Boleyn, 2 years, H. Clark, $1,000
Annie Lisle, 1 year, S. Meredith & Son, $600.
Annie, 4 years, S. Meredith & Son, $310.
Royal Duchess 2nd, 3 years, S. Meredith & Son, $1,650.
Royal Duchess 3rd, 1 year, S. Meredith & Son, $1,200
4th Louan of Woodlawn, 4 years, J. H Spears & Sons, $2,700.
4th Louan of Longpoint, J. H. Kissinger, $525
3rd Louan of Longpoint, 1 year, C. C. Parks, $1,000
1st Louan of Longpoint, 2 years, S Meredith & Son, $1,075.
2nd Louan of Longpoint, 2 years, S. Meredith & Son, $1,125.
23rd Louan of Woodlawn, 2 years, M. Flynn, $700.
Gem, 6 years, T. W. Garrard, Martinsburg, Mo., $685.
L. G. Ray, 3 years, Wm. Pritchett, $625.
Susan Sodowsky, 1 year, R. M. Priest, $400.
Prairie Blossom and calf, 5 years, J. H. Kissenger, $1,000.
Baroness Bates 3rd, 7 years, W. R. Duncan, $1,000.
Pride of Woodlawn, 2 years, calf Alfred's Pride, 1873. Cow by Prince Alfred, calf by Prince Alfred. Sold together to H C Wright, Curryville, Mo., $475.
Ida Bell, 2 years, Wm Pritchett, $475

At Mr. J. C Jenkins' sale at Petersburg, Kentucky, 20 cows were disposed of at an average of $276 75, and 10 bulls at an average of $284. For 30 animals the amount realized was $8,373.

At Mr. Ryan's sale at Abingdon, Illinois, 35 cows and heifers and 14 bulls were sold at good prices. The highest price realized for any one animal was $720, at which two cows were sold; and the highest price for a bull was $305.

At Mr Thomas Smith's sale in Kentucky, 22 cows and heifers, were disposed of at an average of $204, and 10 bulls at an average of $133. Total for 32 animals $5,818.

The Best Grain to Make Wool.

We find in the New York *Economist* the following estimate of the relative value of the different grains as wool producers, and give the list for the purpose of calling out from practical sheep men an opinion as to its correctness. Our own experience is that Indian corn is entitled to much more consideration than seems to be accorded it by the *Economist* writer. True it makes fat, but fat is necessary to the heaviest growth of wool. Our best averages have always been secured from the sheep that were in the best flesh. It may still be in order for Eastern writers to decry corn as a feed for sheep; but the day for misleading Western farmers by any such theory is gone by We copy the remarks of the paper alluded to, as a matter of interest, without vouching for their accuracy, though, with the exception alluded to, we have no reason for doubting their accuracy:

"A point to be noted is the sort of food on which sheep are nourished, for a tillage land may be made, by the aid of fertilizers, to produce forty per cent. more than its usual yield, so may sheep be made to give forty per cent. more wool by having their food adapted to the special formation and growth of that article Now, one of the chief constituents of wool is albumen, and hence those cereals which contain the most albumen make the most wool when given as food to sheep. A glance at the following table will show this.

	Pounds of Wool.
1000 pounds of potatoes, raw with salt make	6½
1000 pounds of mangold, wurtzel, raw	5½
1000 pounds of wheat	14
1000 pounds of oats	10
1000 pounds of rye, with salt	11
1000 pounds of rye without salt	12½
1000 pounds of barley	12½
1000 pounds of peas	16½
1000 pounds of buckwheat	10

From this we see that peas, wheat and rye, which contain the largest percentage of albumen, produce the most wool, giving about twice the number of pounds that roots of equal weight do. Indian corn-meal, oil-cake, and similar gross substances, are the best food if tallow is wanted; but if the object is the most and best wool, the sheep owner must rely on hay and water, with a daily allowance of the best grains, and potatoes, or carrots, or green food."

Keep the Skin Clean.

No one thing aids so much in preserving the health perfect, especially during the summer months, as a thorough cleansing of the skin and keeping its pores open. And it is not only true of human beings, but also of animals. A favorite trotting-horse is carefully groomed, curried, and washed; but the truly noble beast, the ox who makes our bread for us, or furnishes us meat, is neglected. A dirty skin is the first cause of more than half the ills that flesh is heir to, and while a person may be, in the eyes of some, overnice, it is hardly possible for him to be injuriously clean; nor is it possible to give any beast more currying and rubbing than it will like. At any rate, it is not possible that even the best attended to will get any more.

The advantages attendant upon the thorough currying and washing the hair and hide are additional beauty, a better digestion, hence greater ease of fattening and on less amount of food, and, directly and indirectly, an influence for good upon the whole animal health, among which may be mentioned less liability to diarrhœa. Every stable, whether for cow or horse, should have its curry-comb and brush; to these some add the card; and there should be also a tub for water, or weak soap-suds, and a sponge. These should be used at least once in two days in warm weather, and any farmer who has never tried it will be astonished at the marked improvement in his cattle if he will only adopt this plan as an experiment even for a few days Everyone who has ever enjoyed the luxury of shampooing by the hands of a skilful barber after a long dusty ride can have some idea of how improved a cow or ox will feel to have his or her skin well cleansed of dust after a long hot summer day. The cow thus treated will yield more and better milk; the ox or work-horse after his skin is cleaned sleeps well and is rested; the next morning he goes forth to his work with an elastic step, and a consciousness in every movement of health and strength. The time and care taken in cleaning their skins is more than returned in a better product or increased labor. One might just as well expect a first-class crop from a field full of weeds as good work from an animal never curried, or a large yield of milk from a cow whose skin was foul. The skin is the outlet of thousands of foul matters which nature throws off from our bodies; it is itself constantly wearing away, and the dead particles require to be rubbed off rather than allowed to accumulate among the animal's hair, causing that covering to become unhealthy. Some farmers complain that their cattle are constantly rubbing down their posts and fences. A little currying would stop all such trouble.

We would also say a few words to the farmers themselves. The proper cleansing of the skin is the secret of good health The effects of the dust and dead-skin accumulation may not be immediate, but it will show itself in a fever in the Fall or pneumonia next Winter. The Summer promises to be one with periods of intense heat and sudden changes of temperature, and no farmer who values his life can afford to neglect anything which will tend to aid in averting the tendencies to disease which may exist in the atmosphere or weather.—*N. Y. Times.*

Brown Leather for Reins.

Rein leather should be made of the best ox or steer hide. Those made by Europeans are retained in a liquor made from equal parts of an extract of pine and alder barks, to give it the proper color. To make this mixture the extract must be put into six times its bulk of soft water and allowed to stand eight days, shaking it more or less each day, to assist it in dissolving. The skins are placed in this solution and allowed to remain two or three hours, when they are removed and hung up in the shade to dry. It will require from four to six applications to secure a good chesnut brown; if washed with alum water it will become a good orange brown—a favorite color for reins. Much of the foreign rein leather is alum tanned, which they claim is more compact than the bark tanned leather. Russet leather, treated with the above solution, is said to take a good rich brown, although not quite equal to that obtained if the solution is used during the process of tanning.—*Harness and Carriage Journal.*

Sale of Her Majesty's Yearlings.

The annual sale of her Majesty's yearlings, bred at Hampton Court, took place in the paddocks, at Bushey Park, last month Amongst the buyers were Lord Lonsdale, Lord Rosslyn, Mr. Fisher, Mr. Crawfurd, Mr Chaplin, and Mr Alexander. The return will show that the sale was a good one, and that the two highest priced lots disposed of were relatives to those two well-known horses of past and present times—The Earl and Kidbrooke Particulars appended:—

		Gs.
Br f, by St. Albans—Garnish	(Mr. Waterhouse)	15
B f, by St. Albans—Venus	(Mr. Curtis)	30
Ch c, by St Albans—Inez	(Mr Beard)	30
Ch f, by Trumpeter—Lady Dar	(Mr Emmett)	45
Ch f, by Mentmore—Rosaline	(Lord Rosslyn)	100
Ch c, by St. Albans or Mentmore—Heroine of Lucknow	(Mr John Nightingall)	130
B f, by Trumpeter Hepatica	(Mr Chaplin)	55
Ch f, by Trumpeter—Lady Palmerston	(Mr J. Barnard)	80
Ch c, by Trumpeter—Bradamante	(Mr F. Fisher)	210
B c, by Young Melbourne—Ariadne	(Mr Ainsley)	1,5
Br c, by Young Melbourne—Miss Foote	(Mr W S Crawford)	520
Ch f, by Trumpeter—Agrenora	(Mr W. Clay)	175
Br c, by St Albans—Braxey	(Mr J H. Houldsworth)	50
B c, by Trumpeter—Himalaya	(Lord Lonsdale)	140
Br c, by Young Melbourne—Bay Celia	(Lord Lonsdale)	1,000
Br c, by Young Melbourne—sister to Little Lady	(Mr W S. Crawfurd)	1,150
B f, by Young Melbourne—Viridis	(Mr J H. Houldsworth)	180
B f, by St. Albans—Julie	(Mr T E Walker)	125
b f by Young Melbourne—Miss Evelyn	(Mr. Chaplin)	340
B c, by Thunderbolt—Lady Ann	(Mr C. Alexander)	65
B f, by Young Melbourne—Theodora	(Mr Chaplin)	200
Ch f by Trumpeter—Circassia	(Duke of Beaufort)	180
B c, by Trumpeter—Lady Melbourne	(Mr. F. Fisher)	105
Total		£5,060

Vienna Horse Exhibition.

An international horse show in connection with this Exhibition, will be held at Vienna from the 18th to the 27th of September next. The immediate management of the show has been entrusted to a special committee under the presidency of his Excellency, Count Grunne, Master of the Horse to his Majesty the Emperor of Austria, and with the concurrence of his Excellency Baron de Scharwz-Senborn, the Chief Manager of the Vienna Universal Exhibition. Horses will be received from the 15th to the 17th September inclusive, and will be arranged for exhibition according to the breeds and varieties found in the respective countries. All horses exhibited will be entitled to compete for the prizes, which will consist of medals, honourable mention, and testimonials, and to agricultural breeders of limited means, of money prizes. A certificate of merit will be presented with the awards. The jury, of which his Excellency Count Grunne will officiate as president, will consist of accredited authorities of all countries from which horses are sent to the Exhibition A race meeting, with various prizes, will be held on the 21st and 23rd of September, of which a special programme will appear. On the last day of the horse show (September 27) a public auction will be held for the sale of any animals exhibitors may wish to dispose of in this manner, particulars of which will be published in due course.

Keep the implements under cover, or if this can not be done wash or paint them with petroleum Saturate all the wood-work. The more you can get it to absorb the better

Clacking and Over-Reaching in Horses.

Common as are these two faults, they are frequently misunderstood. An over-reach is looked upon as an unavoidable accident, and clacking treatedby irrational alterations of the hind feet shoes. We couple them together because they present some common features. Both consist of interference with the fore foot by the hind one, both are due to some temporary defect in the action, and both can be prevented by altering the form of the shoe.

Clacking or, as it is sometimes called "forging," is the name given the sound produced by the hind shoe striking the fore one in progression. It is usually heard at the trot, and seldom noticed in adult horses. It is most common in young horses out of condition and especially noticed when they are tired. The noise is produced by the hind shoe striking the under surface of the fore one just behind the toe, not at the heels. When the blow has been repeated so as to leave an impression, the marks are found on the inner edge of the fore shoe. This is important, as it shows us that the length of shoe is not at fault, and it suggests the removal of the part where striking occurs. Removal of this edge is equivalent to making a shoe concave instead of flat on the ground surface, and such a shoe is found to effectually prevent a recurrence of the objectionable noise.

The ordinary hunting shoe, especially the narrow one made in a "cress," in the best possible form. For harness horses, where more substance is required for wear, the ordinary shoe seated on the outside instead of the inside is usually sufficient. A case may be met with in which this alteration is not effective. We must then alter the hind shoes, making them square at the toe, with two clips—one on either side—and set back a little on the foot. The wall at the toe should not be raised off, but allowed to protrude a little.

Too often the hind shoes are the first to suffer alteration, sometimes of a very objectionable kind; for instance, we have seen the toe of a hind shoe made diamond shape and prominent, so as to come in contact with the sole of the forefoot instead of the shoe. This is a most irrational and somewhat dangerous expedient. It leaves the offending part of the fore shoe untouched, and favors the infliction of injury to the foot. Even when the hind shoe is only made short and placed back on the foot, there is a risk of the horn at the toe being unduly worn, and there is a shortening of the leverage of the foot which must more or less affect the powers of progression.

If a horse "clacks," rest contented at first with altering the fore shoes as we have described; improve his condition, and ride him up to the bit, but not past his pace. "Over-reaching" is an injury to the heel of the fore foot. It is sometimes merely a bruise, but more often a lacerated wound, a small round portion of skin being left hanging, nearly detached from the heel. The offending part of the hind shoe is its inner circumference or edge, so that the injury must be caused by the hind foot being in the heel, and the skin caught as the foot is retraced. The inner edge at the toe of a hind shoe becomes very sharp after a few days' wear, and will cut like a knife.

As in "clacking," the indication for prevention is to remove the offending edge. This cannot be thoroughly done with a file but when the shoe is hot, the edge behind the toe can be cut out with the "fuller" so as to leave the shoe concave. Off over-reaching is an accident peculiar to the gallop, it is well always to shoe hunters so as to guard against the occurrence. The neatest and best hind shoe for a hunter is made, like the fore one, in a "cress," and presents a concave ground surface and rounded edges.

When a heel is injured, it is always well to try and save the piece of skin. It should not be cut off until it is certain that it will not reunite to the tissues beneath. One good fomenting on reaching the stable is enough; after that use the simplest water dressing, and under no circumstances use poultices, which only increase the chances of a slough and retard the healing process. Should healing seem slow, apply a mild stimulant, such as a piece of lint wet with a mixture of carbolic acid, one part, to glycerine, twenty parts.—*Scientific American.*

Desirable Qualities in a Pig.

Of all the desirable qualities in a pig, a vigorous appetite is of the first importance. A hog that will not eat, is of no more use than a mill that will not grind. And it is undoubtedly true that the more a pig will eat in proportion to size, provided he can digest and assimilate it the more profitable he will prove.

The next desirable quality is, perhaps, quietness of disposition. The blood is derived from the food, and flesh is derived from the blood. Animal force is derived from the transformation of flesh. The more of this is used in unnecessary motions, the greater the demand on the stomach, and the more food will there be required merely to sustain the vital functions—and the more frequently flesh is transformed and formed again, the tougher and less palatable it becomes.

This quality, quietness of disposition, combined with a small amount of useless parts, or offal, has been the aim of all modern breeders. Its importance will be readily perceived if we assume that seventy-five per cent. of food is ordinarily consumed to support the vital functions, and that the slight additional demand of only one-sixth more food, is required for the extra offal parts and unnecessary activity. Such a coarse, restless animal would gain in flesh and fat, in proportion to the food consumed, only half as fast as the quiet, refined animal. To assume that a rough, coarse, savage, ill bred mongrel hog will require only one-sixth more food than a quiet, refined well bred Berkshire, Essex or Suffolk, is not extravagant.—*Harris.*

Hitching Horses with the Lines.

Many of our exchanges have published the following very improper manner of hitching a team with the lines: "When there is no hitching post handy a horse may be safely tied in the following manner:—Take the reins and pass them round underneath the hub outside of the wheel and give them a hitch to one of the spokes. If the horse starts the reins are drawn up, instantly checking him, and as soon as he commences to back they are as instantly loosened. If in addition to this, when there are a pair of horses, one of the traces is loosened the team will seldom move far enough forward to start the waggon without being checked by the bits."

When a small lad, we saw a farmer with a two-horse waggon loaded with barrels of cider hitch his horses by wrapping the ends of the lines once around the hub, then tying to a spoke. Thus the team was left standing in the street, which ran along the brow of a steep hill. When the man returned he found his horses—one dead—waggon and cider all at the foot of the hill badly smashed up.

After having stood until they became restive they started forward, when the lines brought them up with such unusual roughness that they balked back with all their might, and before the loaded waggon had stopped moving the lines began to wind around the hub so as to draw the horses back. The hind wheels were cramped in the right direction to go down the bank, and sooner than one can tell the story, team, waggon and all went rolling and tumbling down the steep bank more than one hundred feet distant into the creek. This impressive lesson taught us never to fasten the lines to a wheel, which we never have done. Rather than do it we have often unhitched the team and tied the halter to a wheel.—*New York Herald.*

Experiment in Feeding.

In the April number of the *American Farm Journal*, I notice an article on the nutritive qualities of timothy hay, which makes 100 lbs. of timothy hay equal to 355 lbs. of rye straw, 220 lbs. of oat straw; 51 per cent. of corn, 59 of oats, and 49 of rye. Now, who can believe that? Let one of our Pennsylvania farmers take 350 lbs. of rye straw and 98 per cent. of rye chop (which according to the computation, would be equal to 300 lbs. of hay,) and feed and work one horse on hay and the other on the rye chop, giving each all they want, and when the stock is exhausted replenish it and continue to do so for two, three or four months, keeping a strict account of the amount of both kinds fed, and then ask him which horse has done the best according to the value of feed fed, or rather the amount of feed, according to the computation. My opinion is that the rye straw and chop would be equally as nutritious, pound for pound, as the hay. And if I am right, the straw and chop would have over one-third more nutrition than the hay, for you have 300 lbs. of hay and 453 lbs. of straw and chop. If you feed the horse 30 lbs. of hay each day the hay would last ten days and the straw and chop a fraction over fifteen days. I do not believe there can be a possible doubt of the straw and chop being more nutritious, pound for pound, than the hay. If anyone thinks so, let him try it. Just so as to the oat-straw and corn. Let anyone take three pounds of corn-meal and twenty of good oat-straw, and feed it against thirty pounds of hay during the winter, and he will find his stock will do the best on the straw and meal, giving the hay the benefit of the two and a-half per cent. thrown off on the straw. I have seen the same computation as to the relative value of timothy hay as compared with other food for animals; but I don't believe it will hold water.—*C. J. Moore, in Germantown Telegraph.*

Tact in Feeding.

As an excuse for the wretched looking objects to be seen on some farms, and as a reason for not obtaining better animals, it is often said, what would be the use of having anything well bred on such land? The best stock in the world would soon be no better. This is partly true, for poor feeding will cause degeneracy in each succeeding generation; but however bad the soil may be, tact would force some forage crops for summer, and roots for winter, to assist the thin herbage for the warm season, and to help the dried-up, old, withered hay through the cold winter.

It is astonishing to see the good effects produced by judicious management of stock of all varieties, each generation becoming superior to its ancestors, if fed and treated in a better way, and if a wise discrimination is brought to bear on the proper mating of the parents; as witness the sheep of the present day, compared with those of forty years back, and see how very much finer the descendants of the Arabian horses are in England, in spite of the pernicious practice of over early training.

It is not altogether the liberality in feeding, that tells on the colts, the calves and the tegs; there is a certain watchfulness and care combined with a nice perception of what is required, which none but an experienced person knows how to exercise to benefit the young animals from the time they are born, till perfect in their full growth and beauty. It is useless for people who think they know everything, to cavil at this statement, for I assert that there shall be, say 20 colts, 20 calves and 200 tegs, put under one man's supervision, and a like number under another's, each having facilities in every respect, growing what they please, and choosing whoever they like to wait upon them; yet there shall be double or treble a superintendant's salary difference in the value of the two lots when they come to be a year old. Last spring I saw colts and calves which staggered from weakness, and were naught but a frame of bones, when there was everything at hand to have made them fat, if there had been any tact on the premises. It is so in many instances. The animals want a change in their lodging, in food, in air and exercise; require to have some sunshine on them; or there are some simple laws of nature neglected, through ignorance, probably, for the manager may be excellent in his way; he may know how to mend everything on the farm, but the live stock; he may say "come along," to every man that works with him, but not get along the young animals which ought to be in a continual thriving state; in short, be totally deficient in knowledge of the proper treatment of cattle, &c., excepting in cases of "hollow horn" and "tail evil."—*G. G., in Country Gentleman.*

Is Pea-Straw Good Fodder?—A correspondent says he has not found pea-straw as valuable for fodder as good oat or wheat straw.—Very likely. And yet good pea straw may be so cured and fed, as to be worth far more than any other straw, unless it is choice bean-straw. It is more nitrogenous than wheat, oat, barley, or rye straw, and should be fed, to get out its full value, in connection with a small quantity of corn. Sheep that have a pound of corn each per day will fatten more rapidly on pea-straw than on wheat or oat straw. The better plan is to let them have all they will eat of both pea and wheat straw—say pea-straw morning and noon, and wheat or oat straw at night. But we apprehend the trouble with our correspondent is not so much in the way of feeding, as in the method of cutting, curing, and preserving the pea-straw. If the peas were allowed to grow till dead-ripe, and after cutting were allowed to remain in heaps in the field day after day without turning, and were exposed to rains and dews until nearly all the soluble matter was decomposed or washed out of the straw, and half the leaves were knocked off them before they left the field, and they were stacked in a damp condition, it is not difficult to understand why "the sheep and the chemist do not tell the same story" in regard to the value of the straw. On our own farm we have found pea-straw from a luxuriant crop of peas, cured without rain, nearly as valuable as clover-hay.—*American Horticulturist.*

Poultry Yard.

Bronze Turkeys.

This is one of the hardiest of all breeds of the domesticated turkey, and when well cared for, for size and plumage has no equal. In early spring, perhaps, one of the finest sights in the barn-yard is the bronze gobbler strutting about in full plumage, varied and numerous in tints as the rainbow. Gobblers of this breed at nine months old, or at the beginning of the first breeding season, frequently reach the weight of 25 to 28 lbs., and hens 14 to 18 lbs. The second year will add to the weight of the gobblers six to eight lbs. and to the weight of the hens four or five lbs. A few gobblers will reach 40 lbs. the third year, and a few of the hens 22 lbs. Extreme weights are 45 lbs. for gobblers and 24 lbs. for hens. In the *American Standard of Excellence* we find the exhibition points, from which we extract the following:—"*Neck, Breast and Back*—Black, beautifully shaded with bronze, which glistens like gold in the sunlight, each feather ending in a narrow, glossy, black beard extending entirely across the feather. *Under part of the body and thighs*—Black, similarly marked to the breast, but colors not so rich or decided. *Wing bow*—Black, with a brilliant greenish orange or black lustre. *Wing primaries*—Black, barred across with white or grey—the more even and regular the better—with a warm edging of white on the outer web. *Wing secondaries*—Quills, black; outside web grey, narrowly edged with white; inside web dark brown, mossed or shaded with grey; the whole of the flight feathers may be edged with white, but it is rather objectionable. *Wing coverts*—Rich, beautiful bronze, the feathers terminating in a wide black band; the wing when folded having a broad bronze bar across it divided from the flight feathers by a glossy black ribbon-like mark formed by the ends of the coverts. *Tail*—Black, each feather pencilled irregularly with narrow bands of brown, and ending in a broad, greenish bronze band. HEN.—The entire plumage of the hen is similar to the cock, save that the colors are not so bright and distinct, and the edging of the feathers is more frequently white, or rather pale buff, than black. On the back, the edging is very narrow between the wings, and increases in width towards the tail, being about three-eighths of an inch on the coverts. On the breast the body of the feather is brown, ending with a narrow edging of white buff, divided from the brown by a narrow, glossy black band.

In rearing this breed, or indeed any other variety, almost everything depends upon the parent birds, yet in nothing are farmers more careless. The common practice is to sell off the heaviest birds in the fall of the year and at Christmas, and take the late birds of light weight for breeding. The excuse for this is, that the heavy cocks wear the feathers from the hen's back, and that heavy hens are more apt to break the eggs in the nest, but the real fact is that the old birds are sold off because they have four or five pounds more flesh upon them, leaving only yearling hens to breed from, a practice very objectionable. The turkey does not attain its maturity until the third year; and the largest, strongest chick can only be secured from mature parents. So common is the practice of selling off everything at a year old or less that it is almost impossible to get stock two or three years old. In purchasing breeding birds, cocks should not be less than thirty pounds, and hens sixteen to eighteen. Large, well-formed birds of perfect plumage will always produce good progeny, not only more beautiful to look at, but will bring much more satisfactory prices in the market and from the breeder. Good stock then is the first element of success in turkey breeding. With good stock and a fair share of attention, turkeys are not so difficult to raise, but with poor, weak stock, and careless management the success will be limited indeed, as it ought to be. With good stock secured at the beginning of the new year, a variety of grain should be fed; occasionally some beef scraps may be given until March. If the weather is severe and the cock is disposed to cover the hens, it is better to feed more sparingly until the weather becomes settled and the danger of freezing eggs is over. Early chickens are desirable, but it is not worth while to risk too much to secure them. An old barrel placed in a bunch of evergreens, by the wall or fence near the barn, makes a very good nest, giving shelter from the rain, and affording the seclusion which the hen so much covets. A mature hen will ordinary lay more eggs than she can cover. It is a good plan, therefore, to give the extra eggs to a common hen, and in a flock of a dozen or more turkeys, the sittings of two or three may be broken up to furnish eggs for the common hens to hatch. Several hens should be set at the same time, so that the chicks of two hens may be given to one mother. One turkey will take care of thirty young with as much ease as she manages half of that number. The hen that is released from material cares will very soon lay again, and hatch a second clutch. In setting the hens, they should not be near those that are to hatch later, or the latter will abandon their nests to help to take care of the young chicks that they hear near them. They are close sitters, when off the nest, feeding with great haste, and after a few days, show a strong desire to return immediately to the nest after feeding and dusting themselves; there are, however, times when it will be necessary to watch the hen and drive her back to the nest. They brood their eggs from the 27th to the 30th day, according to the surrounding temperature. As soon as the chicks begin to peep through the shell the mother makes it known by a peculiar plaintive sound. She will always hatch the larger part of her eggs, frequently every one. Sometimes the hatching goes on so rapidly that you will find a whole nest of chicks before you suspect the presence of any. There are many recommendations for the first food, but there is nothing safer or better than bread crumbs soaked in water or milk, or coarse ground Indian meal made into dough, and fed to them in small quantities, and frequently. In the first ten days they want careful attention. A good plan is to make a pen for the chicks of boards, about 12 feet long and 12 to 15 inches wide, into which the chicks may be put, leaving the hen free. They cannot then follow her, and when she finds they do not come to her call she will take up her quarters in the pen and be quite contented. If they are suffered to stray at this early age, they will get thoroughly soaked from the wet grass, and be likely to die. In all wet weather the mother and chicks must have shelter for several weeks. As the chicks grow they need an increase of food, and a greater variety may be allowed. They will eat anything that is good for their mothers, except the whole grain; but the size of the cracked corn may be increased with their growth, and after a few weeks they may be left to forage for themselves; but they should be brought home every night with great regularity. If this habit is formed early it will require very little to attend to them, as they will come home regularly every night. With a good range young turkeys will pick up insects enough to keep them in good thriving condition. Dry summers are most favorable for them, insects, especially grasshoppers, abound, and they lose no time in foraging. From June to September they will in the main take care of themselves, and benefit the farm by the havoc they make among the insects. If specially large birds are desired they should have extra feed as early as September. All kinds of grain are good for them. A mash made of boiled potatoes, Indian meal and skim-milk given to them warm is highly relished in the cool autumn mornings. At from six to eight months old the cocks ought to weigh from 18 to 24 lbs., and the hens from 12 to 15 lbs.

Feeding Fowls.

Where there is a family, and consequent consumption, there are many auxiliaries, such as bread crumbs, groats that have been used for gruel, etc. But it must be borne in mind that these are in the place of other food, and not in addition to it. When this can be had, other food should be diminished. I am not an advocate for cooked vegetables, except potatoes. Boiled cabbage is worse than nothing. In fact, it must be born in mind, corn, either whole or cracked, is the staple food, and the others are helps. Do not give fowls meat, but always have the bones thrown out to them after dinner; they enjoy picking them, and perform the operation perfectly. Do not feed on raw meat; it makes fowls quarrelsome, and gives them a propensity to pick each other—especially in moulting time, if the accustomed meat be withheld. Hundreds have purchased birds, above all Cochin Chinas, on account of their great weight, which, being the result of meat feeding, has proved a real disease, incapacitating them from breeding. Where proper food is provided, all is not accomplished; it must be properly given.

No plan is so extravagant or so injurious as to throw down heaps once or twice a day. They should have it scattered as far and wide as possible, that the birds may be longer and healthier employed in finding it, and may not accomplish in a few minutes that which should occupy them for hours. For this reason every sort of feeder or hopper is bad. It is the nature of fowls to take a grain at a time, and to pick grass and dirt with it, which assist digestion; but if, contrary to this, they are enabled to eat corn by mouthfuls, their crops are soon overfilled, and they seek relief in excessive draughts of water. Nothing is more injurious than this: and the inactivity that attends the discomfort caused by it, lays the foundation of many disorders. While speaking of food, it may be observed, that when, from travelling or other cause, a fowl has fasted a long time—say 30 or 48 hours—it should not be allowed any hard food. For the first three hours it should have only a small portion, say a teacupful of sopped bread, very wet, so much as to serve for food and drink. If the bird appears to suffer much from the journey, instead of bread and water give bread and ale.—*Cor. Mich. Farmer.*

Dressed Poultry.

In order to obtain the highest price, poultry must be well fattened and dressed and packed in a proper manner. In the first place never send inferior, half-fattened fowls or turkeys to market. Poultry should be killed by bleeding in the neck or by cutting off the head, but never by wringing the neck. They should always be dry picked, and if the feathers are plucked before the bodies are cold, this is easily done, but on no account should poultry intended for market be scalded, as the skin is sure to be broken and the value is lessened full one-third. As soon as the birds are picked the heads should be cut off and the blood thoroughly drained from the neck, which should then be wiped dry. The tail and wing feathers should always be removed, the entrails drawn, the wings of turkeys clipped. The birds should then be put in a dry, cool place, until thoroughly cold. In packing, use clean barrels or boxes, lining the sides and ends with paper, but never use straw as it creases the poultry besides leaving more or less chaff that injures the appearance of the birds. Always fill your packages closely to prevent the poultry being moved about.—*Prairie Farmer.*

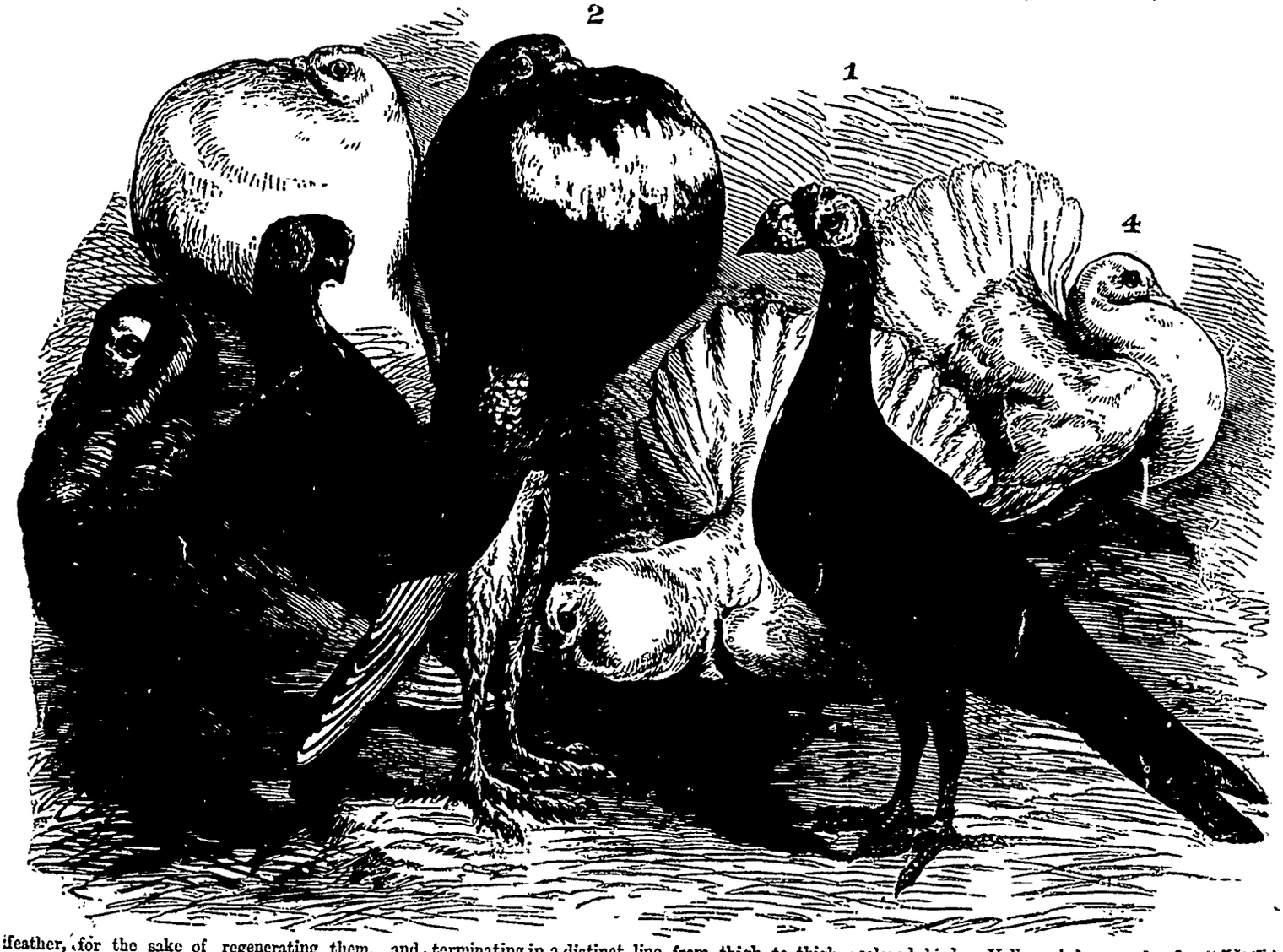
The Pouter Pigeon.

In the "Columbarium" of John Moore, published in 1735, the descriptions of the English pouter there recorded are almost identical with those now held by the best fanciers. They are five in number, namely; 1, length of leg or limb; 2, length of feather, 3, slenderness of body; 4, size and carriage of crop; 5, color. Their general formation or structure, may be further explained as follows: They should have a large and rotund crop, narrow girth, and long pinions, the points of which should meet over the tail, but by no means should they cross each other, for when such is the case the birds' butts or shoulders become prominent, and so detract from the apparent size of the crop and slenderness of girth. This defect is oftentimes noticeable in birds that are heavily feathered on the legs or vulture-hocked, and as a consequence generally lose that long stride and important bearing which is so attractive

in a good pouter. The long-muffed ones invariably strut about in an awkward and stumbling manner, carrying their body in too horizontal a position, lifting high their legs, crossing their wings, and appearing as though they were stepping through water and were desirous of passing through unspotted. This is one of the reasons why the heavily muffed birds do not find the favor their brethren with downy clothed legs so often and so reasonably lay claim to.

Varieties.

Pouters for exhibition are divided into five varieties, viz. : blue, yellow, white, red, and black. Fig. 2 in our engraving represents a cock bird of the first-named kind. There are also mealy or mixed colored pouters which are the result of crosses with the other kinds,—probably in some cases the amalgamation of the whole, and consequently they are not of a very attractive color, but are nevertheless very useful birds, as they are generally large, and of a vigorous constitution, and are oftentimes introduced with good effect as mates for birds of weaker stock, but of fine



feather, for the sake of regenerating them, and keeping up the size and stamina of those of more value.

Almost all pouter breeders, says Tegetmeir, are agreed that length of limb is the most important property, and is measured from the joint nearest the body to the end of the nail of the centre toe. The length should be 7¼ inches, and the outline of which should be neatly but not entirely hidden with smooth feathers, extending to the ends of the toes. The length of feather is measured from the tip of the beak to the extremity of the centre feathers of the tail, the bird being stretched out at full length. Good cock birds should measure 20 inches; the hen birds of course are smaller. The back must be straight, high-backed or hump-backed birds, are very ugly, and generally have also flabby crops, which they are incapable of fully inflating, but which hang loosely down, much to their disfigurement. The crop when distended, should be of as globular a shape as possible. It certainly should not be so enormous as to extend over the shoulders of the bird, and involve part of the body, nor should it force back the head of the bird till it is bent backwards down towards the tail. The crop should be of good size, neither over blown or contracted. The size of the pouter should be large; but it may be remarked that, although apparently of great size when seen at large, yet when taken in hand they will be found much smaller than would be supposed, as their apparent large proportions are considerably enhanced by the quantity of wind, legs, and feathers, of which they are in a great measure composed. The head of the pouter should be neat, and not large or coarse, as too often seen; the forehead should be high and prominent, and somewhat suddenly receding downwards to the ear; the beak is rather dove-shaped, the wattle thereon small and regular; and the eye without any fleshy substance more than is observable in the majority of pigeons.

The color of a pouter is an important property. Blue pouters should be of a clear and bright color, a shade darker upon the head, neck and tail, than elsewhere; the sides of the wings, breast and back, should be blue, descending from the neck, and terminating in a distinct line from thigh to thigh. The wing coverts (as in nearly all blue pigeons), should be crossed with two black bars, there is also a black band nearly at the edge of the tail; on the sides of the wings. And near to the shoulder should be a few white feathers, as represented in the engraving, these are called the rose, and when good and distinct are a great set off to a pouter. An important feature also in the markings of a pouter is a clear white and well-defined crescent upon the front of the crop or globe. With regard to the reds, yellow-pied, and blacks, they should be marked in a similar manner as blues; they should be rich, bright, and uniform in color, not dappled and uneven. Pure white is a favorite color of many breeders, and few birds can look more beautiful than a clean, long-limbed graceful bird of this color, their eyes should be dark, while the eyes of the other varieties must be red. In addition to these, there are several off-colors, that are not valued in themselves, although the birds may be of the greatest worth as breeding birds. The most common of these is that known as mealy, a kind of dull powdered red of different depths of color in different birds. These mealy birds are often the best in limb and feather, that the fancier breeds, and although as show birds, their color is regarded as nothing, they are invaluable as breeders.

Blue pied pouters should not be matched with black pied as the result generally will be dark birds with chequered wings and black bars, which are neither elegant nor valuable, although in some cases well marked birds of either color are produced. Blues may be matched with reds, if no better match offers, and very good colored birds produced. An excellent cross is a blue cock with a large long limbed mealy hen, the produce will be either blue or mealy. Blue pied and white are not desirable to match, as very white pied birds, or white splashed or speckled with other colors would most probably result. Black-pied may be matched with red-pied or mealy with advantage; but white should be avoided. Red-pied may also be matched with yellow-pied, when good yellow or red birds will be produced; red-pied and mealy may also be matched, but with some risk to the bright red so much prized in the best colored birds. Yellow-pied may also be matched with mealy with advantage. It may be observed that mealy birds when matched with either blue-pied, black-pied, yellow-pied, or pure-white, often produce young most perfectly marked or colored without a trace of mealiness; and hence a good mealy bird is always regarded by fanciers as valuable for breeding stock. It is a fact that mealy birds are often the longest in limb and feather, the slenderest in girth, and the best in carriage of any in the stud.

In breeding for length of limb and feather, it should not be forgotten that the influence of the hen over form and size, is generally superior to that of the cock; thus a poor cock mated with a superior hen, will produce much better birds than a good cock if matched with a short limbed hen; size and limb take after the female parent; color more usually follows the male. Thus a white cock with a long limbed mealy hen, would be more likely to throw good white birds than a mealy cock with a white hen. In mating birds, it is always desirable that any deficiency in one shall be counteracted in the other; thus a bird with heavily feathered legs would be judiciously mated with one deficient in this qual-

ity. Another with too much white, with one that has too little, and so on. Too close inter-breeding should always be avoided, brother and sister should never be matched, nor if possible should any birds be paired that are closely related, as weakness of the limb and deterioration alike of size and length of limb, will be the result, while change of blood on the other hand, gives vigor, size, and constitutional hardihood.

CURIOSITIES IN NATURAL HISTORY.—The flea, grasshopper and locust jump two hundred times their length—in the ratio of a quarter af a mile to a man. In the migration of birds the males arrive several days in advance of the females. Fish and birds can see through the nictiating membrane that they draw over their eyes to screen them from the sun. The bones of fish are hollow, and filled with air instead of marrow. It is said that perfectly white cats are deaf. The Angora cat has one eye blue and one yellow. Black rats are used in Germany to exterminate the grey rats.

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