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The Field.

Preserving Roots in Heaps.

It is probable that the cultivation of roots would become more general if the handling of such a bulky crop could be rendered easier than it is generally found to be. As they are too tender to stand the severe frosts of our winters, roots must be carefully protected; and the protection of a crop which under good cultivation may reach from 500 to 1,000 bushels



Fig. 1.—Building a Root-Heap.

per acre is no light task if they are to be carted to a cellar for storage and removed therefrom for use. But it is quite unnecessary that a cellar should be provided for them. As cellars are generally built beneath the dwelling house, and are also used for the preservation of the milk and butter, and as roots give off naturally a strong odor, which is often by reason of the inevitable decomposition of some parts of them very offensive, a cellar is in every way an unfit receptacle for any large quantity. The convenience and health of the family inhabiting the dwelling above are unfavorably affected; and butter in such a place acquires a disagreeable scent and flavor. Roots should therefore never be stored in the cellar beneath the house; but in pits, which is a method very much more convenient and equally safe. The pits may be made in the field where the crop is harvested, or they may be made in a yard or field near the barn. A slightly elevated spot should be chosen which will be dry at all seasons. On this the roots should be heaped in a pile about six feet wide at the bottom



Fig. 2.—Covering Heap with Earth.

and four feet high, sloping to a point at the top, as shown in fig. 1. The heap may be made of any length, or the roots may be put in several heaps. We last year saw one of these pits 1,000 feet long, which contained nearly 15,000 bushels of mangels.

The roots ought not to be put up until they have dried somewhat, nor should they be covered with earth until there is imminent danger of frost. There is then much less danger of heating and decay than when they are covered up before they become dry. The straw covering should be a foot thick. A foot of earth and three inches of straw is better than a foot of earth and three inches of straw. The straw should be laid on straight and evenly so as to shed rain. It should be gathered closely at the top for the same purpose. The covering of earth, which should be free from stones, should be about six inches thick, and should be laid on compactly and well beaten down. At spaces of about six feet apart there should be wisps of straight straw placed upright and projecting through the earth covering. These are for ventilators, and serve to carry off the moisture and heat from the roots during the sweating or fermentation which they are sure to undergo to some extent. One of these pits may be opened at any time during the winter in moderate weather, and when a stock of roots sufficient to last a week have been taken out it may be closed again, taking care that it be done as quickly as possible.—*American Agriculturist.*

How to Build Root Houses.

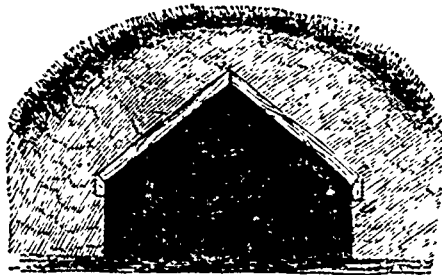


Fig. 1.—Section of Root House.

These who design to build root houses for the storage of their root crops, should undertake the work at once. In reply to many inquiries we have prepared the following suggestions and directions for building these store houses. Such frost-proof buildings are not only serviceable as root-cellars, but if carefully built will make very desirable dwellings both for winter and summer use, as what is proof against cold in winter is also proof against heat in summer. Figure 1 shows a section of the root house. Mainly, it is an excavation three or four feet deep, the earth from which is thrown up over the roof, forming a frost-proof embankment. If the earth is solid clay, no lining is needed, but a piece of timber or pieces of stone may be let into the upper edge of the excavation, as shown in the figure, as a support for the rafters. Where lumber is scarce, as on the Western prairies, the covering may be of brush and coarse hay, which will serve as a support for the earth. If the roof is then covered with sod it will very soon be-

come rain-proof, but as rain rarely falls when and where these houses are needed most, as during the winter season in the far West, this is not of very serious consequence. For the purposes of farmers further East, who enjoy greater facilities for procuring material, a good timber and plank roof well pitched or tarred, would be better. A stone building as shown in figure 2, would be still more preferable where its cost would not be too great. If the stone

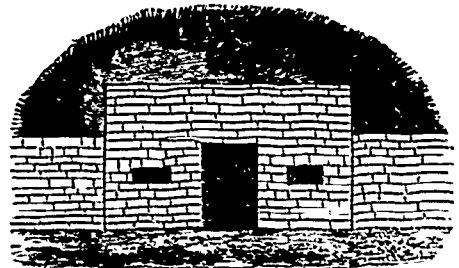


Fig. 2.—Root House with Stone Front.

can be gathered on the farm, such a root house with an arched roof and stone wall front, with an excavation four feet deep, 34 feet long, and 16 feet wide, should not cost more than \$150. By a little extra outlay in cementing or water-proofing the roof, and rough dressing the stone for the front, a very shapely and respectable looking building may be erected. Of course, double doors and windows are needed in all these buildings. The essential point, protection from frost, and variations of temperature, are the same in all of them. For those who live in a wooded country a log or heavy timber house would be the best. Such a one is shown at fig. 3. The interior is similar to those already described. A log house is built over the excavation with double walls at least a foot apart. The space between the walls is filled with earth, and the roof, which rests upon the inner walls, is covered with at least a foot of earth also. The earth roof may be covered with a double roof of boards, laid so as to leave an air space



Fig. 3.—Root House of Logs.

of three or four inches between the earth and the boards. Tight double doors should then be added, and one or two ventilators left in the roof; these may be filled with straw in severely cold weather.—*American Agriculturist.*

The Britannia Farms.

Mr. James Howard, of Bedford, England, chiefly known to the world as a distinguished implement-maker, is also an enterprising farmer. We find in a recent number of the Gardener's Chronicle, an interesting account of his operations in this direction, a condensation of which may prove suggestive and instructive in some particulars.

His estate, on which he has recently erected a fine residence, is located two miles north of Bedford, on a range of hills, composed of "drift," or boulder clay. It is described as a beautiful spot, forming part of one of those wide and charming landscapes of rural scenery for which England is noted, the valley of the Ouse filling the lower level, and giving perfection to the picture. The land was of a very unpromising character when the present proprietor took possession of it, consisting of heavy clay, cold and stoney in some parts, but under Mr. Howard's energetic management, it has wonderfully improved. He has this season completed his fourteenth harvest by steam cultivation, and up to the 25th ult., had further advanced his work by breaking up and crossing 60 acres of pasturable, and also, notwithstanding very unfavorable weather, "crushed" or crossed 170 acres more. Even in the climate of England where the frost is less helpful and the springs are more leisurely, the best farmers appreciate the great advantage of fall ploughing.

Mr. Howard is particularly careful and highly successful in his meadow and pasture lands. It is no wonder that in England the grasses are so durable, when it is considered with what pains they are sown and established in the soil. Mr. Howard follows his land for two years previous to sowing grass seeds, and then sows them, without a crop, and in the early autumn, instead of the spring, finding that in the most active period of vegetation, weeds compete with the grasses, necessitating costly extirpation of them. Close grazing stock, like sheep and horses, are not permitted on the newer pastures, or are only permitted to pass lightly over them late in the season for three or four years till the turf is well established. Mr. Howard believes in the old Suffolk ditty which inculcates judicious laying down and careful treatment of grass.—"To break a pasture will make a man. To make a pasture will break a man." In nothing perhaps, do Canadian farmers more need to take lessons from their British brethren, than in the treatment of meadows and pastures. We are too superficial, slovenly, and negligent in regard to our grass lands, and it is not surprising that, under the circumstances, they are not more permanent, clean harrows, cinerashes, dressings of barn-yards, artificial and liquid manures, are the chief means used by Mr. Howard to maintain and increase the productivity of his grasses, but what Canadian farmer ever dreams of such things, or does any thing better than dream about them?

Mr. Howard is an advocate of deep cultivation, but after careful experiment, does not favor the extra deep tillage contemplated for by Mr. Mechi and others. He has had plots dug two and three feet deep, but finds that they yield no better crops than are grown in fields which have been tilled to an average depth of twelve inches.

Drainage is thoroughly carried out on this well-managed estate. Some of the land was at first drained 4 feet deep and 19 yards apart, but finding put in the theory that the deeper the drain is the water apart they may be, but upon about 40 acres it was found necessary to put in intermedial drains. On such lands it has been ascertained that however deep the drains, they must not be more than 7 or 8 yards apart, and Mr. Howard's mode of doing them from 3 to 3½ feet deep and 22 feet apart. It is a noteworthy fact, that with all this drainage, it is considered that the ventilation and purification caused by worms is of immense service. As the land has been cultivated

they have increased, and are valued as a highly-efficient army of under-ground farm laborers.

As already mentioned, Mr. Howard employs steam power on his farms. They comprise 636 acres, including 40 acres of wood, and 196 acres of pasture, of which 150 acres have been recently laid down as a park. With the amount of land he cultivates, steam power versus horse-power means eleven horses, instead of eighteen or nineteen. Beside the substantial question of cost, it is found that while the best neighboring farmers who use only horse-power can get as good crops of wheat, they cannot do as well with roots, and that is a drawback of itself, sufficient to decide the case in favor of steam-power. The autumn cultivation by steam is not usually finished before the end of October or early in November, but as fine and long days are essential to the most profitable use of this powerful tillage machinery, it is considered desirable to get through before autumn is "let in winter and rough weather," and the tackle is then carefully stowed away "until the fly-lark gives the signal for spring-work to commence."

Mr. Howard practices the following rotation of crops:—1. roots, (i. e. kohlrabi and mangold); 2. barley; 3. beans; 4. wheat; 5. roots, (i. e. kohlrabi, turnips, rape, mustard, and cabbage); 6. wheat; 7. clover; 8. wheat. Beside the manure made on the estate, superphosphate of lime is purchased to the extent of about 20 to 25 tons a year, giving an average dressing of 5 cwt. per acre for 80 acres of roots.

We append without condensation the account given in the Gardener's Chronicle of Mr. Howard's

Live Stock.

From twelve to twenty calves are weaned yearly, and dairy cows supply the house. A herd of Ayrshire is beginning to collect, nine have been purchased at the late Highland Show at Stirling. The pastures, including the new grass land, are stocked with cattle by the purchase of young Short-horns at one and a-half and two years old. The older beasts are fattened off, the rest are kept in yards in store condition. About thirty oxen are fattened yearly. As regards the feeding of the land, the sheep are by far the most important agents, even on this heavy land, and very much to the credit of the management; but the finer herd of "large white" pigs must be mentioned with honor, due quite as much for their excellences as for the scores of prize cards which I saw attached to the walls of the feeding-house, and which have promoted the circulation of the stock throughout England and many foreign countries. Mr. Howard tried Berkshire, but prefers the large white breed, which he comes to maturity earlier, and yields a larger profit than either Berkshires or the small breed. The figures and facts relating to sheep will only occupy a few lines, but they are important in connection with heavy land farming and the national food supply; I therefore invite the reader to form a mental abstract as he scans this dry summary between crop, fishes, clay-land fields, with bare plots, and occasionally, perhaps, a few apologetic notes, and the cheerful scene of mutton-making which is a feature during the winter. There are, in brief, 300 ewes and 1000 lambs, which are fattened on 60 acres of kohlrabi and mangold, commencing November 1, and finishing on mangold carried to the pasture in March and early in April. 160 ewes and their lambs are also provided for. The average crops of kohlrabi are from 20 to 25 tons per acre, and of mangold about 30 to 35 tons. The roots grown on the first and fifth course of the rotation would hardly support so large a head of stock, but for the large quantity of chaff (i. e. clover and sweet straw) which is consumed in the fold in addition to corn and cake. This dry diet is found essential on heavy land, to keep up the natural warmth; and in order to induce the sheep to consume a large quantity of chaff, two sets of troughs are provided, the dry and the succulent food being served separately three times a day, the former is always afforded first to the animals, so as to tempt them to take what is good for them when they are hungry. In the winter months they eat probably more than 1 lb. a head of chaff daily, and as much at the morning meal as during the rest of the day. Horses: The number is ten and a jobbing pony, or scarcely more than 2½ per 100 acres of arable land, throwing the 235 acres of pasture into the bargain. I shall avoid elaborate calculations, confining myself merely to a simple narrative of farm operations in connection with a name so widely known. I may, however, mention here that I never knew a farm in

Essex, well done as to tillage by horse labor only, where a good breadth of roots and beans were sown, with fewer than four horses per 100 acres. And on a large heavy-land farm in Essex the pasturage does not often exceed 20 or 30 acres, including the orchard and home paddock. The horses are valuable, several of them prize-winners, and, judging from their appearance, they must have cost considerably more than that nimble 12-horse power traction engine, which has supplanted at least eight horses on this occupation, which knocks off the heavy field work before the close of October, and in favorable seasons by the beginning; drills a 50-acre field beautiful in two days, sleeps through the winter, or does the thrashing; takes the field again in spring, and sometimes, in case of need, is fastened to a train of harvest waggons, and brings home the corn while the horses are engaged in reaping.

English Method of Land Drainage.

A farmer in New Brunswick lately wrote to Mr. Mechi, to ask his advice about land drainage, and especially that he would, if possible send out from England a man competent to take charge of such work. This letter was placed by Mr. Mechi in the hands of a draining engineer at London, whose name does not appear. He answered as follows, in a letter containing some items of information which will be of interest to our readers:—

"LONDON, E. C., July 5.
"DEAR SIR—Mr. Mechi has sent me your letter to him of June 19, knowing, as he does, that I have long been engaged in works of land drainage. Our approved mode of operation here is, 1st, to bore and dig the ground; 2nd, take the necessary levels; 3rd, to lay off the lines of main and minor drains, and fix the depths; 4th, to make a map of the proposed work; 5th, put this in the hands of a well paid foreman or superintendent, if the work is on a large scale, or of a pipe-layer only, if it is under 100 acres, and not more than from 20 to 30 men are to be employed to cut the drains, and who would require only two or three pipe-layers. The foreman or head pipe-layer sees that every drain is cut to its proper depth, with an even and uniform bottom to fit the pipes accurately, and then he sees all the pipes laid before they are covered; and as these men are paid good day wages, they have no inducement to "scamp" the work, or to allow it to be imperfectly executed by the cutters, who are all paid by the piece, i. e., so much per perch or per chain. When the work is completed a map is made, showing the line of every drain and the size of the pipes used. For ordinary farm land drainage, the depths run from 3 feet to 5 feet, the lines of the drains being always along the greatest falls, irrespective of the artificial configuration of the surface, except in the case of very high ridges or permanent pasture land, when they may occasionally be run in the furrows with advantage. I often employ over 1,000 hands, and on one estate which Mr. Mechi visited a few years ago I employed over 600 men for two years, and drained nearly 30 acres a day. The wages we are now giving to foremen are from 30s. to 40s. a week, to pipe-layers from 20s. to 25s. An estimate for the drainage of an acre of ordinary stiff soil would be as under, which is 20 per cent. more than it would have cost ten years ago:—

Table with 2 columns: Description of work and cost in £. s. d.

Total, £ 47 9 1
I believe, out of my staff, I could find a man who would be willing to emigrate, and, I think a married man would be the most reliable. I think I could select a suitable man of experience, if he were guaranteed, say a free passage and 30s. a week for twelve months, and perhaps he could induce some good hands to come with him, if they got a free passage, or some other inducement. It is a good time to get such men, as drainage is specially slack in England at present, and, out of regard for my friend, Mr. Mechi, to whom I am personally indebted, as we agriculturists are publicly, I shall be glad to arrange the matter on hearing from you. I don't suppose there are anything like fortunes to be made in your country for farmers, but I should think good skilled

laborers could improve their position. Our great want in this country is decent cottages, many of which are at present a blot on the face of England, and a limited allotment of land, but as we are now being practically forced to recognize labor as the source of all wealth, this evil may be remedied before long. Our difficulties in connection with land arise mainly from the embarrassed circumstances of land-owners, their limited interest in their estates, their failure to give tenants security for their capital and possession, and the preservation of game. Their ill-considered political power is now gone, through the ballot; and as farmers can now, without ruining themselves, support their principles instead of their landlords, I think improved relations will ensue, and then feelings of satisfaction will run through all classes, and we will then make the most of our people and our land.—*Country Gentleman*.

Restoration and Renovation of Soils.

In concluding an interesting paper on this subject, before the Wisconsin State Agricultural Convention, says the *Western Farmer*, Secretary Field gave the following summary of his advice to farmers:

1st. Make all the manure you can, and apply all you make in a condition best suited for food for plants and where most needed.

2nd. Cultivate thoroughly, stirring the earth to a great depth; plough, harrow, roll, cultivate, subject the soil to repeated changes, so that, aided by the action of frost and rains, it may be so reduced and refined as to be compelled to yield its supply of food in such abundance that the annual crops may feed and fatten upon it like the stall-fed ox.

3rd. Renovate with clover. From observation and experience I am convinced that by an occasional seeding to clover, say once in five to eight years, as circumstances seem to require, with a rotation of crops, using all the manure made, with thorough culture, the most of the lands of Wisconsin should be in a healthy and highly productive condition generations hence.

4th. If your lands are still being reduced in fertility, apply the best commercial manures you can obtain. Buy in limited quantities and experiment fully, and if found successful, purchase again the same brand, and of the same party, if he stands high in commercial circles as a man of honesty and fair dealing.

A Citizen on the Farm.

Will it pay a city man to live on a farm? This question is often asked me by my friends. I am also asked if my potatoes cost me less than five dollars a bushel.—If my milk does not cost as much per quart as champagne, and numerous other questions, all implying that farming will not pay a city man.—One friend says, I know you spend two dollars on your farm for every one you get from it. A statement of what I have done, and suffered and gained, ought to satisfy these friends, and here it is:—

A few years ago I disposed of my city residence and with the proceeds purchased a farm of about 25 acres, three miles from the city, provided with comfortable buildings; improved and enlarged the house and sheds, provided myself with horses, carriages and waggons for family and farm use—with fowls, a cow, cart, plow, and all the implements for cultivating the land. By this time I had expended all I received from the sale of my city home, and this amount I called my capital stock, chargeable with interest and liable to taxation.

I now commenced work, doing it all by hired help, as the duties of my business in the city required and received from me as much time and more labor than I had formerly given. I opened a farm account and charged to it every expenditure for labor, hay, grain, manure, horse-shoeing, repairs, of all kinds, toll, the cost of all new implements or carts, and every other item, except the repairs to my family carriage and my wife's phaeton. I did not even deduct the time of my men in making permanent improvement on my place or driving the carriage, or the shoeing of the horse I used for going to and returning from the city, but drove as hard a bargain with my farm as Shylock would with a gentile, for I wanted to see the worst of it.

On the other hand I credited the farm only with the cash actually received from sale of the produce; and find that the cash so received will pay, and actually paid, all the expenses of every kind except the interest on the capital and the taxes, which stands in the place of rent, or interest on a tax upon the same sum invested in a city home. My family of seven persons has had, free and clear of expense, all the vegetables, fruit, eggs, poultry, milk and cream, of the best and freshest kind, that we could eat. We have also had

flowers to enjoy, horses to ride or drive whenever we wished, and, better than all else, so much good fresh air that our physician's bills have diminished in tenths. The expenses of fence-side and mountain times have diminished wonderfully, and ice-cream, and strawberries and cream, cost only the price of the sugar, and are superior to any we get in the city.

And so, my friends, farming has paid a city man and my potatoes do not cost me five dollars a bushel, (I learned something from the *Country Gentleman* about cultivating them) and the milk costs nothing, although we use from ten to twenty quarts a day; and my champagne costs me nothing, for I don't need it, and I have discontinued using wine as dinner, for I don't need that, and farming would pay you too, if you would try it.—*CITY FARMER, in Country Gentleman, Albany, N. Y., Sept. 10, 1873.*

Weather Proverbs.

Evening grey, and morning red,
Sends the shepherd wet to bed;
Evening red, and morning grey,
Is the sure sign of a very fine day.
Mackerel sky, mackerel sky,
Never long wet, and never long dry.

Rain before seven,
Fine before eleven.

A rainbow in the morning
Is the shepherd's warning;
A rainbow at night
Is the shepherd's delight.

When the wind is north-west,
The weather is at the best;
But if the rain comes out of the east,
'Twill rain twice twenty-four hours at the least.

If the grass grows in January,
It grows the worse for't all the year.

A January spring
Is worth nothing.

Of all the months in the year,
Course a fair February.

As many milchcows in March
So many frozies in May.

If March comes in like a lion, it goes out like a lamb;
If it comes in like a lamb, it goes out like a lion.

A cold April
The barn will fill.

April showers,
Bring summer flowers.

When April blows his horn,
'Tis good for both hay and corn.

Mist in May, and heat in June,
Makes the harvest come right soon.

Who delf his coat on a winter's day,
Will gladly put it on in May.

A dripping June
Drings all things in tune.

Be it wet, or be it woe,
Beams blow before May doth go

Come in early or come in late,
In May comes the corn-quake.

Plant your 'taters when you will,
They won't come up before April.

The west wind always brings wet weather,
The east wind wet and cold together;
The south wind surely brings us rain,
The north wind blows it back again.

February fill the dyke,
Lither with the black or white.

A dry March never begs its bread.

An April flood
Carries away the frog and his brood.

AN INCH A YEAR.—A Minnesota farmer gives, in the *St. Paul Pioneer*, his experience with ploughing a field for wheat one inch deeper every year. The first year he ploughed the land four inches deep, and harvested seven bushels of wheat to the acre. The next season he ploughed one inch deeper and took off twenty bushels per acre. Continuing to plow one inch deeper the next year, he harvested thirty-one and a half bushels. He says, in conclusion: "Last fall I did not go down for the extra inch. I feared if I kept on until I got down 15 or 20 inches, the straw would grow 18 or 20 feet high, and that won't stand the storms of Minnesota; but if we want long straw and heavy wheat we must plough deep. One inch deeper each year is plenty, and if this rule is followed strictly, our farms will be in good condition 100 years to come."

Changing Seed.

If farmers were always careful to sow none but plump grains, of pure seed; that is, seed of one variety, unaltered, we see no reason why they should change the seed. Where seed of a good variety is sown, it will produce a variety inferior in quality, but if greater vigor, the more vigorous kind will gain in the last. All the quality will deteriorate. The old, worn, thrashed grains are sown the seed will be inferior; but where pure, plump grains are sown, a pure, plump seed in good condition, the seed will be anything in the seed-bed that will give the quality, or constitution of the wheat. We have known instances where farmers have carefully saved the most perfect ears of wheat from year to year, and the quality of the variety has improved. We believe, that if equal care were exercised in saving seed wheat, the seed would be better. We do not doubt that benefits have resulted from changing seed, but we suspect that it was where a careless farmer bought his seed of a more careful one.

We would advise, where a change is made, procuring seed from a better and cleaner soil, and we should consider this of greater importance than a soil of different texture or composition.

We should grow seed directly adapted to the climate, and we should change just as often as our seed becomes poor.—*Rural Home.*

ANALYSIS OF THE POTATO.—It has been found by analysis that in 100 parts of potato there are water, 70.0; starch, 24.0; azotic matter, 1.60; fatty matter, 1.1; and ash, 1.0; also, 1.65; mineral matter, salts, 1.55; total, 100.0. The potato produces at least 20 per cent of dry matter, 1.65 of which must be subtracted from the starch, which reduces the food part to 23 per cent, 24 parts of which are starch.

Some one asked *The Prairie Farmer* how to kill burdock, and the reply made:—We have frequently killed the troublesome plant by cutting off the roots of which under the ground with a spade, and then throwing in the hole a handful of salt or quicklime. Sometimes we chose to kill them with water the better buds appeared on the stalks. Simply covering the roots would probably have killed them, but was found to make sure work. If there is any other effective way of squelching this pest, let it be made known.—*Rural Home.*

ADVANTAGES OF DRAINING.—A drained soil will keep off the water as it falls, or nearly as fast. And what is best? There is only moisture, and air is admitted; and the land is seldom so cold and wet that no progress of the seed is made; and once begun, it will stand a good deal, protected as it is by the soil. Truly our land, if it is drained, either naturally or otherwise, especially if there is considerable fertility, and the soil is dry and mellow at the time of sowing, fertility has a warming effect. At least this is our experience, and that of those around us.—*New York Herald.*

CRIBBING CORN.—The *Journal of the Farm* says: "Many a sore-fingered harker has wished that his loads of corn could be shoveled direct from the wagon into the crib, without having to throw out a portion by hand and the shovel could reach the bottom of the wagon. In such cases every finger is like a false horse leaping from the collar, and the work is only done from a conviction that there is no help for it. In loading corn take out a piece of pine board six feet long and a little wider than your shovel; place an end on the tail board close to one corner of the wagon, and the other on the bottom end; fill up as usual. In unloading, shovel down the board to the bottom of the wagon, and not an ear need be touched by the hands."

PURE WHEAT.—In Yates County, New York, a careful experiment was made by a correspondent of the department with Tule and Treadwell wheats, with reference to testing their respective merits. During the summer of 1872, an eight acre field of gravelly loam, which had been cultivated the previous year in fodder-corn, was summer-fallowed. The field was manured in 1871 and 1872, in the latter year the manure ploughed under at first ploughing. Upon a plot of one-fourth of an acre of this ground, five quarts of Tule were sown broadcast, September 10, 1872. Treadwell was drilled upon the remaining part of the field September 18th, at the rate of two bushels per acre. The former was harvested July 7th, and yielded four and a quarter bushels, or thirty-fold upon its seed; the latter was harvested July 25th, and yielded twenty bushels per acre, or ten-fold upon its seed.

Implements of Husbandry.

The Food Steamer and Engine.

In a recent number we gave a somewhat lengthy description of the construction and uses of the Food Steamer, and of its great utility, especially on stock farms. Our illustration on that occasion showed merely an exterior view of the implement, as it ap-

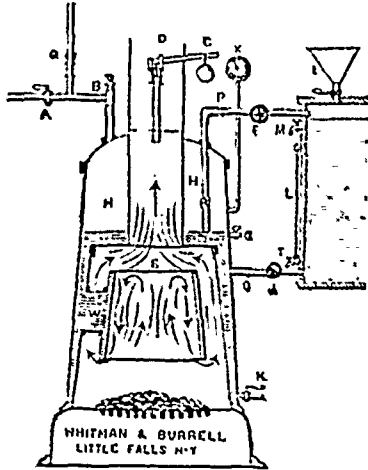


Fig. 1.

pears when ready for use. Since then we have given more attention to this most important article, and in the present number we furnish, through the kindness of Messrs. Whitman & Burrell, New York, an interior sectional view of the boiler which illustrates it well, in all its details.

When the tank or barrel is filled with water, the faucet *i* and dry-cock *m* are closed, thus rendering the tank perfectly air-tight. The faucets *f* and *j* are then opened, and water will pass into the boiler up to the bottom of pipe *n*, which supplies the tank with air or steam until water comes up over the end of it. The tank being air-tight, no more water can pass into the boiler until the water is evaporated below the end of pipe *n*, when the steam rushing through, forces the water into the boiler, thus keeping it always at a uniform height. The agitation of the water is so violent that no scales adhere to the sides of the boiler, and by simply blowing off every day they are kept bright and clean.

Through the kindness of the same gentlemen we also illustrate in this number another very important use to which the "Steamer" may be applied, viz.: that of driving a steam engine of from 2 to 8 horse power, which may now be had in connection with it. These engines are very simple in construction, made of but few parts, all accessible, and have no joints in the frame. The base, cylinder, frame and arms are

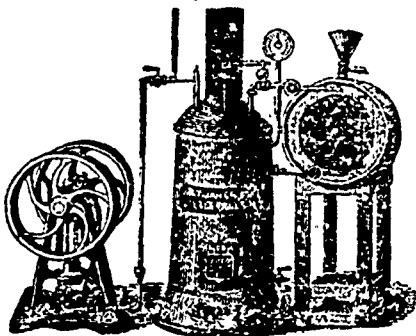


Fig. 2.

likewise all cast in one piece, thus rendering it impossible to get "out of true." When these engines, moreover, are properly adjusted to the "Steamer," the arrangement is such that no boiler pump is required, thus saving the engine from pumping against pressure. When we think in how many different ways such an implement could be applied on the farm—such as chopping, straw-cutting, threshing, wood-cutting, &c., &c., it becomes a question worthy

of consideration, whether it would not prove, on the whole, a more profitable investment than a portable engine got up in the regular way.

The Chopping Mill.

Closely allied to the "Steamer" is the "Chopper," the one being almost a necessary aid to the other; for although various kinds of feed may advantageously be chopped without being steamed, or steamed without being chopped, still all practicable experience goes to prove that the advantages are appreciably greater where the same feed has undergone the processes of both chopping and steaming. Animal-treat to such food thrive better and faster, and their manure is very considerably better than that produced from feeding on the raw material in its natural state; for just in proportion to the richness of the food is the strength of the manure; this is one of the reasons why "poudrette" is one of the best of manures.

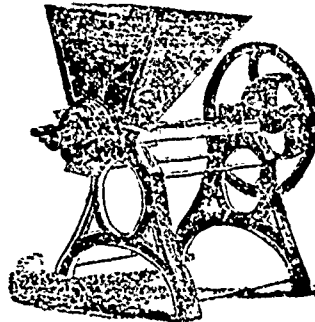


Fig. 1.

Now, that feed is enriched by chopping and steaming, is undoubted, from the fact that there is a saving of both quantity and time from its use, i. e., a certain quantity of food thus prepared will afford more nourishment, and afford it in less time than a similar quantity of the raw material.

The choppers of the present period are generally constructed on one of two principles, viz.: either with millstone grinder, or with fluted or serrated metal ones of different speeds; the latter are now coming into more general favor from their greater durability.

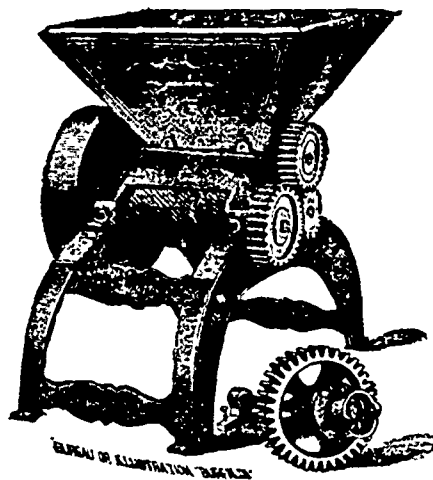


Fig. 2.

The accompanying cuts illustrate two different styles now much used, all got up on the same general principle, viz.: with iron fluted rollers. The grain is fed to two of such rollers, driven at different speeds, and grinding against each other, the feed being regulated by a thumb-screw, and the fineness of the meal being also regulated by set-screws to suit the operator.

Figure 1 represents the mill mounted on a substantial iron frame, strongly braced, which obviates any vibration whilst at work. Figure 2 shows the same working principle on a wooden frame, which is by some much preferred on account of its cheapness. The iron rollers in all these machines are calculated to last for a long time, and when worn dull they can be re-cut at small cost. The machines are also fitted with fly-wheels, and may be driven either by belts or rods as may be desired, and they are capable of cutting or crushing from 20 to 30 bushels per hour, according to the power used.

Canadian Implements at United States Shows.

At the third International Industrial Exhibition, which opened this year, at Buffalo, on the 1st and closed on the 25th Oct., and which proved so highly successful in every respect, the number of Canadian entries in the above class was comparatively small. This, we may remark, has hitherto been the case at nearly all public exhibitions on the other side, and it is probably accounted for by the fact that since a great many if not most of our mechanical improvements and novelties are thought to originate amongst our cousins, it would therefore be quite futile for us, with our borrowed or copied articles, to attempt competition with them.

Now this is an exceedingly erroneous idea. All other things being equal, we believe the inventive and general mechanical genius of Canada is fully equal to that of the United States, and further, that there is no branch of industry fully developed within our borders, which, in its productions, will suffer from a fair, open comparison with its fellows beyond the lines. The great success which attended even the small display of Canadian implements the other day furnishes both an illustration and a proof of this position, and we hope that while it will go far in correcting the false impression which appears to prevail with reference to Yankee and Canadian enterprise, it will also encourage our manufacturers and others to make greater and still greater innovations upon American show grounds.

The International Exhibition at Buffalo is opened to the whole continent, and most of the leading industries of the U States are very largely represented there. The general principle upon which the show is conducted, and awards are made may be gathered from the following extracts from the "Rules and Regulations."

1st. As to the Judges.

"It is provided that judges in each class shall be wholly disinterested, and shall be composed of men eminent for their skill in the Arts, and particularly in reference to the class of articles assigned to them."

2nd. As to the Premiums.

"Rule VIII. The premium list will be published, and all awards shall be for the first degree of merit. No second class awards or decisions will be made or reported in any case."

3rd. As to the strictness of Impartiality.

"Rule XIII. A Competitor for a premium must not be present during the examination of his machine or product by the judges, except at their request."

It will be seen from Rule VIII. above that whilst there may be fifty or even a hundred articles of the same class present on exhibition, one and only one is selected by skilled, disinterested and impartial judges, as superior to all others, and it therefore gets the medal for the first degree of merit.

The premiums, moreover, at this exhibition are not money-prizes, but simple medals—showing that there is nothing but the name and the honor to meet the exhibitor's expense in shipping and transshipping his goods.

Putting these considerations alongside another fact, viz., the proof of satisfactory judging, afforded by the increased display at these exhibitions every successive year, we may safely conclude that the "International" is pretty free from wire-pulling and that articles sent therefor exhibition are judged purely and solely on their merits.

The only entries this year from Canada in the department of Agricultural Implements were

John Watson, Ayr, 1 Straw Cutter; 1 Root Cutter; 1 Chopping Mill.

David Maxwell, Paris, 1 Straw Cutter; 1 Root Cutter.

Of these Mr. Watson was successful in taking medals for his Straw Cutter and Root Cutter. A like result might possibly also have attended his Chopping Mill but it was entered too late for competition.

Agricultural Chemistry.

Butter.

The milk of a cow or other female mammal is seen under the microscope to consist of a clear fluid, containing a number of minute oil globules. If a drop of acetic acid (purified vinegar) be added, many of the globules will be seen to coalesce and form little granular masses of fat. The globules are enclosed in a delicate membrane which the acid seems to break down. This result is accelerated by agitation. The operation of churning consists in agitating the milk till the globules adhere together, or, as it is technically called, till "the butter comes." It was formerly thought that the cohesion of the butter-globules was brought about by the formation of an acid in the milk, as shown by the sourness of the buttermilk, even when the cream used is perfectly sweet. But it has been found that if this acid is neutralized by bicarbonate of soda, the butter will come quite as readily. The best temperature for churning has been found by experience to be between 53° and 55°, Fahrenheit.

Butter, chemically, is a mixture of fats, being composed of glycerine, in combination with palmitic, stearic, oleic, and small quantities of capric, caprylic, caproic and butyric acids. It is to the glycerides of the last four acids that butter owes its peculiar odor and flavor. In practice, butter always contains more or less buttermilk which has not been separated from it. This buttermilk consists of water holding in solution a kind of sugar called milk sugar and casein, or the substance which forms curds, and from which cheese is made. This casein differs from the other constituents of milk by containing nitrogen, and like all nitrogenous organic bodies is very liable to putrefaction. If the casein contained in the butter becomes putrid, it will communicate its decomposing condition to the other constituents of the butter, and hence the latter will become rancid. Rancidity consists in the separation of the fatty acids mentioned above from the glycerine with which they are united in the fresh state, which separation brings out the peculiarly unpleasant taste, smell and other properties of these acids. Intimately connected as this process is with the presence of readily putrescent casein in the buttermilk retained in the butter after churning, it becomes a most important object to get rid of this most injurious impurity—an impurity far worse in its influence on the preservation of the butter than many an adulteration, the detection of which would be fatal to the sale of this important product. Too much stress cannot be laid upon the care which should be taken to free the butter from the buttermilk by the ordinary methods of washing with water, kneading, pressing, &c. In addition to these methods, the admixture of a proper proportion of salt. One quarter of a pound of salt to six pounds of butter has been recommended for this purpose. Another method of preserving butter is as follows: The butter is melted in a vessel immersed in hot water, and the heat continued until all the curdy matter has subsided to the bottom and the butter is transparent. The clear melted butter is then poured off, or strained through a cloth, and cooled by cold spring water or ice. Butter cured in this way is said, if kept in a cool place, or in a close vessel, to keep for six months or more, as sweet and good as when first prepared.

There has been much discussion recently in England on the subject of the adulteration of butter. The detection of some of the ingredients fraudulently added being very difficult. The usual adulterations comprise water, salt, and various kinds of fat, such as lard, suet and dripping. The water and salt are added by melting the butter and pouring them in while it is in the fluid state. By stirring round

until all is cold, the salt and water are thoroughly incorporated with the butter. The presence of the water may be ascertained by placing the butter in a common four-ounce phial, and putting this into hot water until the butter melts. On standing, the water sinks to the bottom, while the butter floats at the top. To determine the presence of a fraudulent quantity of salt, the butter is calcined when the salt is left as an ash. Of course, butter always contains a certain proportion of water and salt; but there should not be more than 1 per cent. of the former, and 5 per cent. of the latter.

At the present time there is a company in New York engaged in the manufacture of artificial butter. The *Scientific American* in its last issue gives an account of this curious process. The suet, after thorough washing, is finely divided by a "hashing machine," by which it is ground and pressed through a fine sieve. It is then exposed to steam heat in large vats for two hours, by which the olein and stearin (combinations of glycerine with oleic and stearic acids) are separated from the animal matter, such as shreds of membrane, fibres of muscle, &c. The fatty matters rise to the top and are drawn off while melted. It is then subjected to powerful pressure in cotton bags. By this process the fluid olein is separated from the solid stearin. The next step consists in churning the olein with one-fifth of its weight of sour milk. At the expiration of twenty minutes the oil is converted into a semi-solid mass, which, on cooling, salting, and working in the usual way, becomes firm, and can scarcely be distinguished from ordinary butter. It is palatable, can be made at a less cost than butter from milk; and owing to the absence of any caseous matter, will keep well in any climate without any tendency to rancidity.

Veterinary Department.

Diseases of the Hock Joint in the Horse.

Bog Spavin.

Bog spavin is the name applied to a soft, puffy tumor situated on the inner and front part of the hock; and consists in distension of the capsular ligament of the true hock joint. It is somewhat similar to windgall, but as the capsular ligament is affected, it proves of a more serious nature. Bog spavin, in the early stage, is merely due to an extra secretion of synovia in the joint, forcing the ligament outwards, and especially at that part where it is not firmly bound down by tendons.

In the healthy joint there is usually about two drachms of synovia for the lubrication thereof; whilst in many cases of bog spavin, the synovia increases to seven or eight drachms, and becomes charged with large quantities of calcareous matter.

This is a very common disease amongst certain breeds of horses in this country, and particularly the heavier class of horses, but it does not prove of quite so serious a character as when occurring in the lighter breeds, as in bloods, or roadsters. The causes of bog spavin may be defined as predisposing and exciting: amongst the latter being sprains, hard and fast work, overfeeding, and the great strain thrown upon the hock; as when a horse is forcibly backed when attached to a heavily laden waggon.

Symptoms.

This disease is very easily detected: a swelling appears on the hock which is soft, and yields readily to pressure, and is altogether different from the hard and unyielding tumor of bone spavin. It is frequently very quickly produced, and in many cases it does not cause lameness. In young horses this disease not infrequently appears after one hard drive; the muscular system may be soft, and the general condition of the animal plethoric, and in this state a young horse is driven rapidly for twenty or thirty

miles; he is put into his stable, and next morning he may possibly be found to exhibit symptoms of bog spavin, which is the result of the excessive demands of the previous day; the process of absorption not having been equal to that of secretion. If an animal is kept at work when these symptoms appear, the spavin very soon becomes confirmed, and extensive disease is set up within the joint; the bones become affected, and all the parts materially altered in structure. Owing to the distension of the capsular ligament, the vein passing over the hock becomes more prominent, and this altered state of the parts is often erroneously termed *blood spavin*. The treatment of blood spavin must necessarily be varied according to the extent and duration of the disease. The horse should be allowed perfect rest, and in recent cases great benefit will be derived from cold applications, or hot fomentations, followed by careful bandaging and moderate pressure—for the latter purpose the elastic truss is very useful. If the horse is in a plethoric condition, it is advisable to administer a good dose of purgative medicine, which tends to increase the action of the absorbents. When inflammatory action is reduced, blisters are useful, and either cantharidine or biniodide of mercury ointment may be used.

In blistering for bog spavin, it is well to apply the blister over a considerable extent of surface. Other blisters are frequently applied, but only such blisters should be used as are not likely to leave a permanent blemish. In recent and mild cases, a complete cure may be effected if the above mentioned measures are carried out in a proper manner. In cases of old standing, and where all the structures of the joint are involved, the joint can never be restored to a sound condition, but very great relief may be afforded by a proper course of treatment, such as giving rest, and the free use of counter-irritants; and, in some instances, it may be necessary to use the firing iron.

Keep the mud off horses legs and heels at this time of year, to avoid the scratches.

A HUMANE ACT.—The act to prevent cruelty to animals while in transit by railroad or other means of transportation, passed by the last Congress, went into operation on October 1. The first section of the act makes it unlawful to keep animals confined while in transit for a longer period than twenty-eight consecutive hours without unloading them for rest, feeding and water for a period of at least five consecutive hours. Violation of the act is made punishable by fine of not less than \$100 or more than \$500.

ABOUT SICK ANIMALS.—Nearly all sick animals become so by improper feeding, in the first place. Nine cases out of ten the digestion is wrong. Charcoal is the most efficient and rapid corrective. It will cure in a majority of cases, if properly administered. An example of its use: The hired man came in with the intelligence that one of the finest cows was very sick, and a kind neighbor proposed the usual drugs and poisons. The owner being ill, and unable to examine the cow, concluded that the trouble came from overeating, and ordered a teacupful of pulverized charcoal given in water. It was mixed, placed in a junk bottle, the head held upward, and the water and charcoal poured downward. In five minutes improvement was visible, and in a few hours the animal was in the pasture quietly eating grass. Another instance of equal success occurred with a young heifer which had become badly bloated by eating green apples after a hard wind. The block was so severe that the sides were almost as hard as a barrel. The old remedy, caleratus, was tried for correcting the acidity. But the attempt to put it down always caused coughing, and it did little good. Half a teacupful of fresh powdered charcoal was next given. In six hours all appearance of the bloat had gone, and the heifer was well.—*Live Stock Journal*.

Entomological Department.

The Potato and Tomato Worm.

During the last few weeks we have received a number of specimens of the larva of the Five-spotted Sphinx Moth (*Sphinx quingue-maculata* Linn.), commonly known as the "Potato," or "Tomato worm." When associated with the latter vegetable it is vulgarly supposed to be an exceedingly dangerous animal, biting or stinging any one who comes in its way, and producing disease or death by the wounds it inflicts. As we have shown on several occasions in former years, in the pages of the CANADA FARMER, these alarming ideas are mere superstitions; the caterpillar is perfectly incapable of inflicting a wound upon a human being; the juices of its food-plant however, are poisonous, and will no doubt produce severe inflammation, and possibly even death, if received into the blood through a fresh cut or open wound.

When we remember that both the Potato and Tomato belong to the nightshade order of plants (*Solanaceae*), the foliage of which is in almost all cases poisonous, e.g. in Henbane, Tobacco, the Deadly Nightshade, the Datura or Thorn-apple, &c., we need not feel at all surprised that careless persons gathering tomatoes should occasionally be poisoned by the rank juice of the plant getting into an open sore. In such cases ignorance suspects nothing from the familiar plant whose fruit we find so wholesome and delicious, but looks about for some animated author of the mischief. Our poor innocent caterpillar is then observed, and being unfortunately rather repulsive in aspect and ornamented with a stiffly projecting tail, he is at once found guilty of a capital crime, and is put to death without further evidence, and without waiting for a word of enquiry or defence.

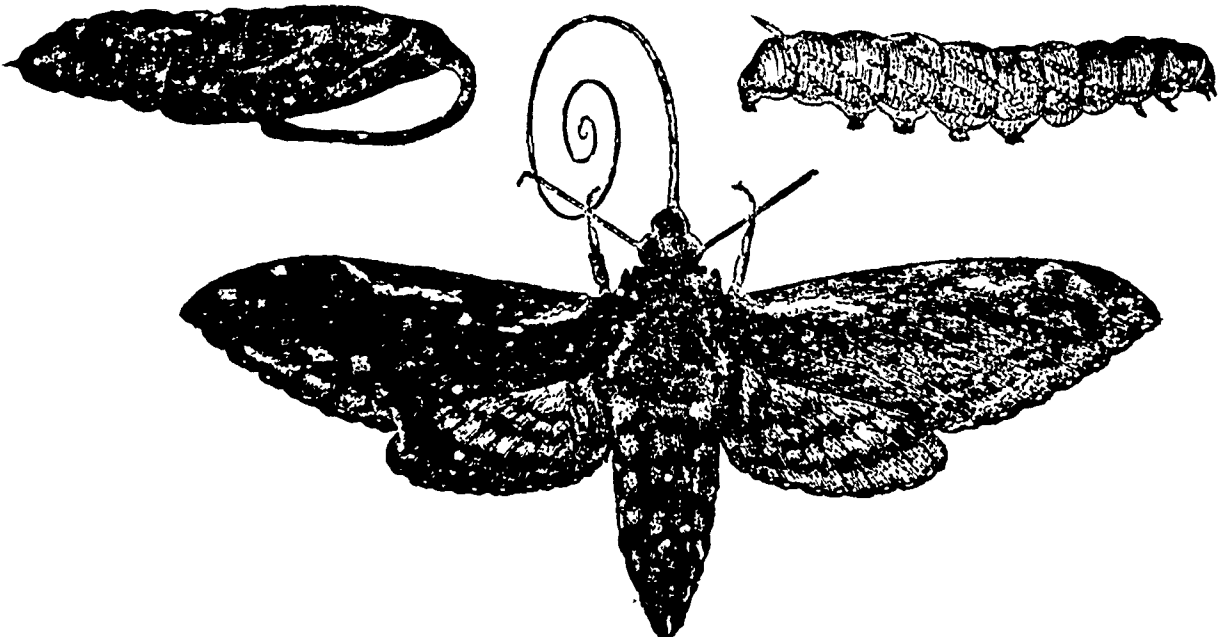
The caterpillar, for whom we are pleading, has been more than usually abundant this year. We have found numbers in our own garden, and have received specimens of it from Dr. Dewar, Port Hope; Wm. McGrath Esq., Erindale. Credit; the Rev V. Clementi, North Douro, and others. It grows to a length of three and a half inches, and the thickness of a man's little finger. Its color is very variable in different specimens, ranging from light green to deep olive, and from pale brown to black; the sides are ornamented with a series of seven oblique stripes, paler in color than the rest of the body; below these is a row of oval spots, which enclose the spiracles or breathing holes. Most conspicuous is the creature's horn or tail, a stiff thorn-like projection placed upon the posterior extremity of the back. The worm is a most voracious feeder and grows rapidly; it usually attains its full size in September, though we frequently see specimens in October. When mature it buries itself in the earth, a few inches below the surface. Here it undergoes its transformation into the pupa or chrysalis state.

The chrysalis is often brought to view when digging potatoes in the autumn. It is of a deep chestnut color, and is remarkable for having the extremity of its head produced into a long slender case, containing the proboscis, that bends over till it touches the breast, and thus forms an appendage very much like an ordinary jug-handle in shape. In this condition the insect remains underground all winter and until the following summer is well advanced, then it bursts its shell, works its way to the surface, and appears as a huge winged moth.

The moth is of a greyish color, variegated with black; its wings when expanded for flight measure five inches from tip to tip, while the body is fully two inches long; the latter is adorned with five bright yellow spots on each side—whence its name of "Five-spotted Sphinx." Most remarkable is its enormously long proboscis or sucker; when not in use it is coiled up like a watch-spring beneath the head, but when

sought to a great extent. Dr. C. Zimmermann, a German by birth, published valuable monographs on *Zabrus* and *Amara* before coming to this country; but here he would never publish the results of his laborious investigations. Dr. LeConte here acknowledged his own indebtedness to Zimmermann's three manuscripts to LaSalle. They contain the latter part of a systematic work on Coleoptera, with descriptions of many hundred new species found in the Southern States.

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period. Dr. LeConte paid a glowing tribute of admiration to Prof. Agassiz, and expatiated on the impulse he had given to correct habits of study and research among naturalists; and expressed regret that he (Dr. LeConte) had not been educated at the feet of that master. The Smithsonian Institution much advanced the interests of science from this date by fostering the costly work of publication. Valuable assistance in the preparation of the *Work of America* and *Amara* has been rendered abroad in the publications of Hagen, Leew, Oshan-Cookin and DeMeuseure. Dr. LeConte here made a comparison between the entomological work published by the Smithsonian and by the State of New-York, very much to the disadvantage of the latter, which he said was compiled by a person ignorant of the science, and illustrated by a draftsman untrained in drawing subjects of natural history.

required to draw up the nectar from long throated pelunias and other flowers, it stretches out two or three times the length of the creature's body.

The accompanying illustrations afford life-like representations, in all but color, of the three stages of existence of this interesting insect.

Economic Entomology.

At the recent meeting of the American Association for the advancement of science held at Portland, Maine, a valuable paper was read by Dr. J. L. LeConte, entitled "Hints for the promotion of Economic Entomology in the United States." As Dr. LeConte is the ablest living Entomologist in America, and his paper contains many suggestions of the utmost value to us here, as well as to our neighbors across the lakes, we feel sure that our readers will be glad to have the following abstract of his remarks, for which we are indebted to the enterprise of the *New York Tribune*, and its series of scientific extras.

"The paper opened with a sketch of the history of Entomological science in America, beginning with Thomas Say in 1817, who was the best instructed zoologist of his day in this country. The text-books on Entomology were then mainly those of Fabricius, Herbst and Latreille, and foreign classifications were adopted by our naturalists. Careful observations of a few noxious species by Prof. Peck and Lr. T. W. Harris were among the earliest contributions to economic entomology. The work of that day was in determining species, and the results attained by Say and a smaller number of his collaborators fixed many hundreds of a species permanently. Dr. T. W. Harris of Massachusetts was a man whose confidence overshadowed his merits, and he was not duly appreciated by himself or by others; and he neglected, or was unable to publish, the written results of his re-

searches to a great extent. Dr. C. Zimmermann, a German by birth, published valuable monographs on *Zabrus* and *Amara* before coming to this country; but here he would never publish the results of his laborious investigations. Dr. LeConte here acknowledged his own indebtedness to Zimmermann's three manuscripts to LaSalle. They contain the latter part of a systematic work on Coleoptera, with descriptions of many hundred new species found in the Southern States.

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The Need of Entomological Researches.

"No branch of zoology is of more importance to our agricultural interests than entomology. It is estimated that Congress and State Legislatures have expended for this class of investigations between 1776 and 1830, \$90,000 to \$100,000, or about 1,000 a year, while the actual annual damage done by insects throughout the United States cannot be less than \$100,000,000. These figures are taken from Dr. Walsh's publication (*Am. Entom. and Bot.*, II., 1839). It is evident that until the science of entomology has made considerable progress, the expenditures of States and individuals towards suppressing noxious insects may be of comparatively little value, and would be in the publications of the State of New-York an instance of how money enough to have printed almost every useful book on entomology that has since ap-

prepared was all expended upon a course which is a monument of practical and ignorance. The principles and general methods of the sciences are to be learned before there is room to hope for a utilitarian progress. To read such a volume several circumstances are favorable. (1) That it is an early prospect of the completion of the American series giving the classification of the several orders. This will, of course, be supplemented from time to time as new knowledge is acquired, and will eventually diminish to a great extent the need of reference to other books, and the purchasing of costly libraries. (2) What are called by the naturalists "type collections"—that is, collections of specimens illustrating particularly the distinctive features of species—of the highest value to the student, these should always be reserved in some public institution, or in some way be secured from vicissitudes of sale or accident. Dr. LeConte spoke of the important result which had been obtained by Linnæus and others from the study of Linnaean type collections, and pledged himself never to permit it to be sold or divided.

Practical Suggestions.

"And now as to the practical application of economic entomology. But a small portion of the insect tribes are sufficiently numerous by nature to inflict injury upon a man or his possessions; but civilization disturbs the check balances of life which naturally keep down insects, and permits in the case of insects those previously insignificant in numbers to become prominent factors in the work of destruction. Two methods are open; to attack on the crops and starve out the noxious insects, or to establish a system of checks on their increase equivalent to those existing before civilization interfered. The second is the more profitable system. Its methods depend upon the habits of the insect, and may be divided into (1) those requiring only personal labor and diligence; (2) personal labor assisted by contrivances; (3) automatic apparatus not requiring personal attention, including also the use of poison; (4) the production of diseases among noxious insects; (5) the introduction among them of parasites and other enemies. Under the first head may be mentioned the destruction of larvae of borers by wires, &c. Under the second, the collecting of plum woodlice, potato chrysochela, &c., by large nets, and their subsequent destruction. Under the third, sowing with poisoned food, as with the nocturnal Lepidoptera, and the use of flies or lanterns to attract nocturnal species to a vessel of poison. Under the fourth, communication of fungoid diseases, like potato-blight, which effects the silk worms, to other lepidopterous larvae—an experiment of this sort having destroyed all the caterpillars in a nine-acre piece of woodland. Under the fifth, introduction and preservation of insectivorous animals, birds, reptiles, and insects. A parasite of a cocoon which attacks the apple tree has recently been successfully introduced in Illinois.

"Mr. C. V. Riley, State Entomologist of Missouri, has declared that the ravages of no invading army can be more disastrous than that of some insects. To effect the saving of millions of dollars now lost by such ravages, the expansion and reorganization of the Bureau of Agriculture and its control by the highest scientific ability, without reference to the wants or clamor of politicians, should be the first step. A mass of notes of habits of injurious insects, collected by Mr. T. Glover, the entomologist of that Bureau, should be edited and published after submission to judicious criticism. Similar publicity should be given to reports on this subject coming from the Engineers, the Coast Survey and other Bureaus. As it is necessary sometimes to starve out an enemy, it is desirable that a fund should be established by the assistance of Federal, State or county authorities to repay owners of infected crops which are to be destroyed to prevent the spread of the infection—as in the case of the army worm in cotton, the Hessian fly in wheat, bark borers in pine forests, the curculion in fruit trees. These two measures Dr. LeConte regards as of primary importance. He also suggests the preparation of lists of the most destructive insect pests, and what is known of their habits; the establishment and cooperation of State entomologists with the chiefs of the Agricultural Bureau when it is reorganized as proposed; preparation of calendars of appearances and disappearances of noxious insects throughout the country; contrivances or apparatus for poisoning nocturnal insects, as previously described, on a large scale; experiments like sugaring for moths applied to those and other insects on a large scale; careful study of epidemics among insects and experiments to introduce such diseases; the preparation of text books for use in schools and colleges by some of our best practical entomologists; the appointment in our colleges of competent professors of entomology."

The Value of the Knowledge of Entomology.

Few persons are aware of the enormous amount of wealth annually taken from the farmers by the insect world; yet it far exceeds the amount taken by railroad monopolies, about which the farmers are complaining so bitterly, and spending so much time to secure legislation to regulate the price of carrying freight, &c.

Now as this amount exceeds that taken by railroad monopolies, why not pay our attention to the insect world?

There is hardly a crop raised by the farmer that is not attacked by one or more species of insects. Farmers are no doubt anxious to get rid of the injurious insects that are infesting their crops; but his usual method of trapping, who knows least the habits of the game. In destroying insects it is almost indispensable to know the habits of them. The codling moth or apple worm, which is so universally destructive to the apple crop, is one which should engage our immediate attention. I will venture to say that the farmers are comparatively few, who should they see the orange codling moth, would know what it was, whether it was injurious or not. By confining some of the fall ground hoppers for two weeks in a tight paper box, the moths may be hatched out so we can see them and become familiar with them. Thus by getting rid of many insects and "hatching" them out, we often find instead of the true insect, many smaller ones of a different species. These are parasites, which should not be destroyed, for they are helping us to destroy the injurious insect. Thus we become familiar with those destroying our crops, and also with those helping to preserve our crops by destroying injurious species.

A friend of mine found, a few days ago, ninety-three larvae of a parasite in a single pupa of the *Danaus Archippus*.

It becomes necessary for us then to study the natural history of insects, to learn of their habits and hiding places, to discover those that are working for us, and direct their operations where they will be most serviceable. But this can not be done successfully until farmers are conversant with insects and acquainted with their properties and economy.

The State Entomologist of Illinois has succeeded admirably in transporting a Chalcid fly parasite of the oystershell borer, to the northern part of his State. Let us profit by his example.—*Indiana Farmer*.

Flight of a Sphinx Moth.

Did you ever see a *Sphinx* fly? There is nothing to compare its motion to, except a flash of lightning. While you are looking at a flower in the twilight, between you and it glides a motion, a moving haziness, which is before you and yet conveys to your eye no definite image. Before you have half thought what it can be, you see the flower again distinctly, and rub your eyes, thinking there must have been some illusion, or possibly an unsteadiness of vision caused by the irritation of that gnat that was buzzing about your head; when, lo! the flower just beyond seems to shiver,—you move to see what is there, but there is a move before you, and a dim shadow flits away like a thought. Can it be anything real? Stand still awhile; and now, in the increasing gloom, as you bend over the *Petunias*, holding your breath, you see a darkness visible drop down before you, but its presence is better made known by the humming caused by the rapid vibration of wings. Stir not, or this aerial body will float away. Now you see it detaches not to alight or touch the margin of the chalice, but, poising itself in air, stretches out its long tubular tongue, and quaffs the nectar at the bottom.—*J. W. Douglas*.

THE FALL WEB-WORM.—The best, and indeed the only feasible remedy for the ravages of this insect is to cut off and burn, or carefully tread under foot, the whole portion of a branch that is covered with the web. As the worms feed always beneath their web, and do not venture over the tree like the Tent Caterpillars, this method of dealing with them is a cure one. Where it is unwise to cut off the branch, as may sometimes be the case with young or dwarf fruit trees, the insect may be got rid of by simply drawing the infested leaves through the hand and crushing the caterpillars upon them.—*Canadian Entomologist*.

The Apiary.

Live Bees at Fairs.

A brother bee-keeper, now at our elbow, suggests that we say something editorially in reference to the practice of bringing lives of bees to agricultural fairs, and letting them loose among the visitors. He says that on a recent occasion of this kind, where he was present, there were three stocks of bees opened out, very much to the annoyance of thousands of people. He does not know if any one was stung, but the bees were buzzing about in all directions, and especially hovered around the refreshment stands, alighting in large numbers upon the water melons and other fruits, and attacking the candies and confectionery.

We entirely agree with our friend. There is no necessity for subjecting visitors at fairs to this insect annoyance. The day is gone by for money-making by means of bee-charming and other styles of apianian charlatanism. It is pretty generally understood, that bees can be handled by taking certain precautions. The person who has not become aware of this fact, must live in some benighted region where there are neither newspapers nor bees, and is not likely to be converted into an apianian by such exhibitions. The merits of a hive can be shown sufficiently without having live bees in it. So many people are nervous with bees buzzing around them that a due regard to the rights of others would seem to dictate avoidance of this thing. If it is wished to show the public the interior economy of the hive, with queen, worker, drone and brood, this can be done with a unicorn hive, having glass sides, to much better advantage than by opening out an ordinary hive.

For various reasons, we feel quite inclined to restrict bees from power to injure, as much as is consistent with honey-gathering. We don't see that they have any particular call to attend fairs. They are better at home. Let them, as the good book says, study to be quiet and mind their own business, going abroad only when duty calls. A word to the wise is sufficient. There are ways enough of giving publicity to bee-wards, without resorting to the method under consideration. We wonder that before now some unlucky accident has not happened, such as might excite public prejudice against bee-keeping and bee-keepers. Lest it should, it is well to leave the honey-workers at home, when the rest of the family go holiday hunting.

There are six substances made by the bees in a hive, viz: honey, propolis, wax, bee bread, royal jelly and cream. **HUBER.**

A weak swarm will weigh from one to two pounds; a middling one from three to four pounds; a good one about five pounds, and an excellent one from six to eight pounds. **KEITH.**

However let your hives be rather too little, than too great, for such are hurtful to the increase and prosperity of bees. If the hives be too great, the bees will be more lazy, working uncomfortably, because they despair ever to finish and furnish their house; but yet if there be a competent number of bees, they will work industriously (though the vacancy be large) and complete as much with combs as shall be sufficient for them. But an over large hive is prejudicial to their swarming. **FURNAS.**

SENDING QUEENS BY MAIL.—In sending queens by mail, I find that a piece of candy and a piece of sponge, moistened with water, answer as well as honey. I prefer the large, round, flat moccas, as they are easily fastened in the boxes, so that they cannot move about and hurt the queens. I have sent a number of queens in this way, and have not lost a single one. I have kept bees for weeks on candy, in the cellar in the winter, and they do well on it; and I can see no reason why they should not do equally as well on it while passing through the mails.—*Cor. American Bee Journal*.

Horticulture.

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

THE ORCHARD.

The Treatment of Young Hedges.

Thomas Meehan, in the *Western Farmer*, says: "Of late years a discovery has been made in the treatment of hedges, of supreme importance. It was the universal advice, and the general practice, to cut the plants to the ground at planting, and then part it still right. But the practice was not carried out. The following summer the growth was cut back to root, the shoots sprout, and perhaps the second year they were cut again, and the third year they were cut again, and so on; but this was not the way to do it. Not only is it wrong so far as the making of a good, stout hedge is concerned, but it takes a good deal of money and labor to a tend to it; and it was very natural for the farmer to say that labor was his great bugaboo, and if he was to be continually bothered in this way he would rather pay double or treble for a lumber fence, and be done with it.

"Many who kept to the faith in constant trimming in the hedge's youthful period, found to their sorrow that with all their labor there would be holes which would admit dogs, and in time larger animals; and only those who had knowledge and skill enough to boot, to look well after their hedges, kept on with this way of making them.

"The plashing system followed this. In this way the plants were allowed to grow straight up for three or four years after planting, and then each one cut half through near the ground and bent over. This presented a series of horizontal stems along the hedge line, and made a successful barrier against intruders. Only half cut, they live, all hours making, of course, a weaker growth; and I am below the cut a lot of sprouts come up, which get thicker the whole mass. But although this way is much superior to the old-fashioned plan, in that it involves no labor for the first two or three years, the plashing itself is a laborious process, and, moreover, the result does not always prove a perfect hedge.

"The new plan was fore-shown in a speech by the agricultural editor of the *Press*, at Harrisburg, some six years ago, and of which an abstract is given in the Pennsylvania Fruit Growers' Society's report. It was there shown that the old idea that pruning strengthened a tree was wrong. The branches seem to grow more vigorous after a pruning, it is true, but a few years of this treatment show the true state of affairs. A dozen willows left to grow unpruned will make trunks of enormous size, and probably last fifty years; while the same willows annually cut down for basket-making purposes, die out in twenty-five, and hardly ever make a trunk more than a foot or so in diameter. Knowing, then, how pruning weakens, we apply the knowledge to hedge-culture. We want to weaken it after it has been made into a perfect hedge, but not before. For a few years we desire to give it all the vigor possible. This is obtained by letting it entirely alone. In this way the roots become very strong after a year or two or five years. Then in the winter, or in the spring before the leaves have pushed, we saw or lop it off close to the ground. The result is a mass of strong, vigorous growth which surprises every one. It can be mowed into shape with a scythe the next summer, and a perfect hedge is made at small cost."—*Rural New-Yorker*.

Beautiful Homes.

How few people there are, comparatively, who make any exertion to beautify their homes, and adorn them both indoors and out, when it is so easy to make home pleasant and attractive. A large sum of money is not required, but simply a little taste in arranging things so as to make them look pleasant and inviting to the eye. None are so poor but that they can make their home a little Eden, if they only have the will to do so. The world is well supplied with trees, and they can be transplanted or grown from the seed for almost nothing. Take a survey of your premises, and then reflect how much you could improve the appearance and value of your home-stead by planting an assortment of trees and shrubbery. Put your evergreens and other ornamental shrubbery in your door-yard, and, in order to blend the useful with the ornamental, plant cherry, pear, peach, and other

fruit trees, also. There are enough fruit trees that are ornamental without planting many of such as bear no fruit, though it is best perhaps, to plant forest trees around a farm or suburban home, and about the house.

If any one thinks he cannot afford to have an assortment of fruit trees, let him plant such as he can get for the digging, rather than be without them. It is a pity to see a homestead without trees of any kind in it; such a home must indeed be a dull and monotonous one, and the inmates of that home are surely dull and miserable beings also.

Children raised and brought up in a home of beautiful surroundings are better and more refined for having been brought up in such a home. Boys and girls, both, should be encouraged to assist in planting them, and to make a garden, and trellises, rustic seats, etc. It will be a pleasant enjoyment for each one to engage in a task as they desire. Every month in the year some improvement can be made in the planting of one's home. Throughout the summer season trees must be carefully watched to protect them from the ravages of insects, and thereby an opportunity to study entomology, which, by the way, is a beautiful and interesting study to the lover of nature.

I hope the time is not far distant when every home in both town and country, that can be, will be surrounded with trees and flowers.

Reader, just imagine how beautiful the whole country would appear if all the farms and homesteads were well supplied with fruit and ornamental trees and beautiful flowers, and then make up your minds to do all you can in this way, and persuade your friends and neighbors to follow your worthy example.

Seek for the year's home most lovely,
Let it be a summer spot,
Where, in sweet contentment resting,
One's soul's bowers are forgot,
Where the flowers and trees are waving,
Birds will sing their sweetest song;
Where the purest thought will linger,
Confidence and love belong.

See the home is made attractive
By reason of its trees and fruit,
The soul's bowers are forgot,
The heart's desires are all forgot,
Such a home is the best,
Sweet and pure, and full of control,
Home with pure and bright surroundings,
Leaves the impress on the soul.

—*Western Farmer*.

Thinning Fruit.

Marshall P. Wilder, in his address at the American Pomological Convention, at Richmond, Va., said:—

"This is a lesson which we have learned, and the necessity of which we have often endeavored to impress upon cultivators, and which every successive season teaches with stronger emphasis. It is absolutely necessary for all who send fruit to market to send large fruit, and the markets are constantly progressively rejecting larger and finer fruit. Even the market pear, which once commanded in Boston markets the highest price, will not now, unless of extra size, sell for any more than if as much as common varieties of large size. A medium sized fruit, or even one of smaller size, may be more economical for use, but in the preferences of the majority of purchasers shall take place, larger fruit will sell better than smaller.

"To produce this, the fruit must not have good cultivation, but must be thinned; and we agree with Mr. Meehan, that for half the trees which bear fruit every year would be benefited by having one-half of the fruit taken off as soon as it is well set, and the overbearing of a tree will in few years destroy it." We may lay it down as a certain rule, that excessive production is always at the expense of both quantity and quality; if not in the same season then in succeeding ones, for when branch is contending with branch, leaf, and fruit with fruit, for its supply of light and food, it would be indeed an anomaly in nature, if this should not result in permanent injury to the trees as well as to the annual crop.

SHEEP IN ORCHARDS—Mr. Jonathan Huggins, the long-time Treasurer of the Illinois Horticultural Society, and a good farmer as well as a good horticulturist, stated, at a late meeting of the Alton, Ill., Horticultural Society, that he had long been in the practice of turning sheep into his apple orchards, and, as long as they have green pasture they will not touch the bark of the trees, but they are carefully watched. He has one old sheep only that knows how to eat apple bark is. When there is snow on the ground the sheep will of course eat the bark. But the only time when the presence of the sheep is needed is in Summer when the wormy fruit is dropping.

Remedy for the Black Knot.

In July examine carefully every tree, and remove every knot, brown or black. If any black ones are found burn them. If a knot is on a small limb, cut off the limb; if on a large limb, remove a portion of the bark and wood with the knot, an inch above and an inch below the knot. Do not fear to cut; no tree bears cutting like the plum, and if this rule is thoroughly applied, in a year or two there will be few to cut, unless your trees stand near a neighbor's trees that are neglected; if so, agitate the question till he cuts them down or takes care of them. If you have trees already nearly covered with the knot, it will be better to cut down and burn them, and start again with new trees, sprouts from the roots of the old trees, if left in their places, will grow much faster than transplanted trees, and if watched closely for a year or two, will then be no more subject to the knot than any others. In the year 1865, I set 70 Bleeker Gage trees. I also started a few from sprouts of old trees killed by the knot. That summer I had to cut severely to keep off the knot. Since then I have been obliged to cut but very little, and now I have an orchard of 75 large, healthy trees in full bearing, with not one black knot to be seen.—*Ulster Herald*.

THE VINEYARD.

The Eumelan Grape.

The Eumelan grape having done so well with us for the last two years, I would call the attention of your readers to its great value. Of all black grapes that I have seen or tested, the Eumelan is the earliest best table grape, splendid in bunch and berry, very saleable, first in market; a prodigious bearer, always ripe before early frosts; strong grower, hardy vine, ripening more wood than any other vine we had, notwithstanding it yielded double the fruit of any other vine of its size, the yield being some seventy-five pounds. Every bunch ripened evenly, though only ten feet of space on trellis, whilst two Concord, same age, each nearly as large, (thirty feet on trellis,) yielded only about twenty pounds, same soil and culture, less in bunch, and not so good in quality. Evidently the Eumelan is the grape of the North. Safe in all seasons, and no dropping of berries if left out as long as any grape dare be left out doors. But as to its wine qualities, I can't say; don't care. I grow grapes only for the joy and comfort of home.

If short of space, the Eumelan is the grape. It gives the greatest yield, is sure to ripen, and is the most luscious of all black grapes we have yet seen. But, if there is space, and a variety is wanted, then for quality, and a sure crop, variety to ripen, the Croton has no superior among the white grapes, so far as we have tested. And of the red grapes, the Iona is our best, though not so early as either of the preceding, and requires a southern exposure, well sheltered from cold winds, a good warm soil, with clay, or better, clay and gravel, to insure well ripened fruit every year. But when well ripened, as they ripen on our grounds, they are truly luscious, keeping well into winter, in a common room, on shelves or baskets, gradually drying into raisins, without the addition of sugar.

We have many varieties on trial, but those named are the best, yet so fully tested. On others, we will report in due time, if deemed worthy. Yet still onward; wedded to none; keeping the best till we get a supply of better; ever trying the new as they bid fair to outstrip the old. No family need be without a full supply of grapes, that has twelve inches of land outside the walls of their house, if they have but the energy to set and cultivate; and a pleasure too in doing the work, the contemplation of adding taste and luxury to home and family.—*Peter M. Gideon, in Prairie Farmer*.

TO PRESERVE LABELS—Some wooden labels were exhibited at a recent horticultural meeting in Germany, which, though constantly exposed to the weather during two years, showed little if any trace of time's effacing finger. The secret of this exceptional immunity, it was explained, lay in "cyanizing" by the following simple process:—"Thoroughly soak the pieces of wood in a strong solution of copperas (sulphate of iron), lay them, after they are dry, in lime water. This causes the formation of sulphate of lime, a very insoluble salt (gypsum) in the wood." It was added that basmats, twine, and other substances used in packing or protecting trees and plants, when subjected to the same treatment, are similarly preserved for an indefinite period.

Manure for the Grape.

The following, taken from a work on Manuring the Vineyard, is good advice. We are of the opinion that the application of a compost of this kind will benefit a vineyard, however rich or poor the soil may be.

It is neither desirable nor necessary to impart to the vine too much luxuriantness. As a rule, it is not enough importance is attached to a second method of manuring, often resorted to as a stimulant to the growth of the vine, though an excessive use of manuring will delay the ripening of the grapes and impair the quality and quantity of the wine produced.

It is very important that the manure should not only furnish to the vine heat and nutriment, but also impart to it warmth. Further, no manure should be used which assists the growth of the wood, but which does not promote the yield of the vine.

Fresh animal manure is not suitable for vineyards, as it contains too much nitrogenous nourishment of excessive richness. It is therefore advisable to mix with it masses of ground, for the purpose of properly dividing the manure. Good ground is mixed with animal manure; horn shavings, ashes, bones, sawdust, dry leaves, manure, etc., in heaps; which must be moistened frequently with water, etc., and frequently stirred or mixed together. — *Farm Journal*.

GRAPE TRELLIS — For a few years past, I have used a spiral spring, made of No. 8 or 10 wire, fastened to the ends of the horizontal wires. This allows for all the strain which can be made by the changes of the weather. And, this method requires no fixing or adjusting as in the method recommended by Mr. B. M. Soule. — *La Rey Saubertan, a FARMER*.

THE WINDOW GARDEN.

Hanging Baskets.

These baskets are among the prettiest ornaments a room can have. They are in universal use, and the florists keep a large supply of them. But these are quite expensive, and besides the florist is seldom seen in the country, where all through the summer flowers bloom by the wayside, in the fields, and grow in thick luxuriance through the woods, and where in winter every home has its own greenhouse plants. It is not to the florists one need go, when, with a few simple directions, any ingenious boy or girl can make pretty and inexpensive hanging baskets. We will give some such directions for those who desire them.

First, take a wooden bowl of any size you desire; then obtain from the woods a quantity of rough, crooked or knotty twigs or roots, soak them in water so as to make them pliable. Varnish the bowl with asphaltum varnish; screw in rings for the hanging-cords to pass through. When the varnish is dry, arrange and fasten these twigs or roots on the bowl in any way your taste may devise. The best way is to bend one of them round the top of the bowl and fasten it securely down; then tuck several pieces round the same way, till the whole surface of the bowl is covered. Fasten one round the top rim of the bowl, by way of finishing it, then varnish these branches like the bowl, and your basket will be completed. If you prefer, you can take, instead of twigs and roots, cones, acorns, &c., and arrange them on the outside of the bowl in the form of flowers, or any pattern your fancy may suggest, and then varnish them. Always use copper nails for fastening the twigs or cones on the bowl.

Baskets may also be made by procuring some small sticks of the oak or maple cut of equal lengths, according to the size of the basket desired. After the sticks are nailed together, a wooden bottom must be fastened down. This basket is easily made, and looks quite pretty when covered with creeping plants.

Other pretty baskets may be made by shaping wire in the form of a basket, painting it green, and intertwining moss through the wires. White, grey or green dry moss is the best for this purpose.

Cocoa-nut shells or sea shells, if you have them, can be made into small hanging baskets, and are very pretty.

All these baskets should be covered in the inside with thick, green moss, both to keep the soil moist and to make the basket look neater. Among the list of common plants suitable for these baskets are the Toad Flax, Ivy and *Lobelia speciosa*, the trailing Moneywort (*Lysimachia Nummularia*), with its yellow flowers, is very beautiful.

A sort of fernery can be made by bringing from the woods ferns and mosses; then arranging them in

the basket, putting moss over the soil that covers the roots.

These baskets, with their green trailing branches and bright flowers, will materially heighten the pleasant aspect of a drawing-room or parlor, or furnish a verandah or window in the summer, as will be found should any of our numerous readers attempt to make them. — *Courier and Enquirer (Ct.)*

A Children's Flower Show.

In November last, several gentlemen in Manchester and Salford, England, formed themselves into a society with a view to encourage a taste among children for the cultivation of pot flowers. They accordingly purchased a number of plants in pots, and gave them to boys and girls who were likely to be assiduous in cultivating them. The first show of the flowers thus given was recently held, and about 250 children brought their plants for exhibition. The collection embraced Tulips, hyacinths, &c., some of which were very beautiful. Prizes of flower seeds were given to the boys and girls whose plants were in the best condition. The idea is certainly a good one. — *Horticulturalist*.

Care of House Plants.

A lady in Kansas gives her plan of caring for House Plants, as follows: "I live in a frame-house, and last winter kept fifty pots of different kinds of geraniums, roses, fuschias, and remountant pinks, all of which received the same kind of treatment, and in the spring my plants were more healthy and the leaves a lurk green color. Many came to me for slips in preference to the greenhouse. Every two weeks all winter I would take a handful of tobacco stems and steep them by pouring boiling water over them until it looked like strong tea, then when the tea cooled enough to bear the hand, I poured it over the plants. Sometimes the leaves would wilt for a few moments, and then straighten out and have that bright, fresh look they have in summer after a shower. Then I would weaken the tea a little more and wet the ground in the pots, and I had no red spider nor green fly." — *Flora's Floral Guide*.

Prepare for Window Gardening.

Those who wish for a good supply of window flowers next winter, should commence preparations about the first of the month. The Chinese primrose, cineraria, magnonette, alyssum, and other desirable plants should be sown in pots, and kept in a cool frame until they grow. Most people fail with these beautiful plants by sowing too late. The wallflower is a nice old-fashioned window flower, and cuttings of the double kinds should be struck at once. Cuttings of geraniums and other things for this coming winter's blooming may still be put in.

Keeping Geraniums through the Winter.

A writer in the *American Agriculturist* says: "I never have any trouble in keeping such geraniums as are worth keeping. They are taken up and cut back pretty severely, removing all the succulent and unripe wood. They are then stacked in a box with some dryish earth about the roots, and put in the cellar for the winter. The trouble is in putting them away too moist. The earth should be almost dust dry. I have a fine old Gloire de Nancy, which goes into the cellar for the fifth time."

THE FLOWER GARDEN.

A True Variegated Rose.

The Hudson N. Y., *Republican* notices the production of a new variegated rose by a florist of that city and says that this is the second one allowed to come into bloom of the cuttings from which he is propagating this rare novelty. It has been named the "Cora Macy," after one of his daughters, and promises to become a flower of great beauty and value. This rose originated as a "sport" from an ordinary monthly rose of deep red color in Mr. Macy's dooryard last season. It was transferred to his greenhouse and judiciously forced until several healthy plants have been obtained, and found true to color. The form and fragrance of the parent rose are fully preserved, while the leaves are all beautifully variegated in red and white, blending in the most perfect manner.

Ferneries.

In planting ferns of all kinds it is well to remember that they do best in coarse-grained, not sifted, soil, except, perhaps, for seedlings which are being started under glass. A very tasteful addition to the plants of this rock bed will be a few roots of our common evergreen ivy, which will flourish beautifully, and cling to the stones over which it clammers just as upon a wall.

Another design for a fernery in a small front-yard will be to build up a kind of pillar of rock-work, formed of old bricks or stones, whichever may be most convenient to obtain, leaving numerous openings on all sides, into which the ferns are to be planted, also *tradescantia*, *saxifrage*, or any other hanging plant, a bunch of handsome wall-ferns, such as maiden-hair, forming a graceful tuft to crown the top. If in a very shady, damp place, the bricks will soon become green and mossy, which will greatly improve the general effect. — *Harpur's Bazaar*.

Roses.

The following list is sent us by an amateur, who says it makes the "craque de la creme" of roses; and that while some will differ from him, if there are better ones, he wants to buy:

Hybrid Perpetuals. — Gen. Jacqueminot, John Hopper, Charles Lefebvre, Anna de Diesbach, Jules Margottin, Victor Verdier, Geant des Batailles, Maurice Bernardin, Monte Christo, Prince Canille de Rohan, La France, Comtesse de Chabrilant.

Bourbon. — Appoline, Emotion, Hermosa, Souvenir de Malmaison, Sombreuil, Imperatrice Eugenie.

Tea. — Marechal Niel, Gloire de Dijon, Saffrano, Viscomtesse de Cazes, Bon Silene, Demoniensis.

Noisette. — Amie Vibert, Mademoiselle Aristide, Woodland Margaret, Celine Forestier, Solfatara, Lamarque — W. S. T., in *Am. Farmer*.

Training Petunias.

A writer in the *Garden* says that a fine effect is obtained by this method of training Petunias. He procures a number of hazel rods, each about two feet long, bends them like croquet hoops, and drives both ends into the bed, placing them at suitable intervals all over it. On these he ties and trains his Petunias, which blossom more abundantly than usual under this treatment. We have seen Petunias successfully treated as if they were sweet pea vines, and trained on a slanting trellis. The trailing habit of this plant, especially late in the season, is not always sufficiently considered.

Warm Water for Plants.

There is no mistaking the perfect effect of warm spring rains upon young grass and plants, and its influence upon the germination of seeds; whilst autumn rains — unless they, too, are warm — produce no such sudden and vivifying effect. Let us learn care from these effects in Nature, and not chill our flowers with cold water, nor poison them with filthy water.

ACACIA RICIANA. — This beautiful species of Acacia, says the *Rural New-Yorker*, has a habit of growth something like that of a Weeping Willow. Its deep green foliage, its long, whip-like pendant branches clothed with golden flowers, the facility with which it can be trained over columns and arches, and the length of time during which it remains in flower, render it one of the most desirable acquisitions for a conservatory. The seeds should be soaked in warm water twenty-four hours before sowing, otherwise they will be a long time germinating.

The autumn competition of fruit, hollyhocks, and dahlias, in connection with the Royal Caledonian Horticultural Society, took place on Wednesday. As on previous occasions, the exhibition was held in the Music Hall, George Street, Edinburgh. The long range of tables which occupied the floor, presented a display of plants and fruits which, if perhaps a little disappointing in some respects to those practical members of the Society who did not care to look beyond the merit of the competition itself, could not fail to prove satisfactory to most of the visitors who thronged the hall throughout the afternoon and evening.

Directly a lot was placed in the pen, he started it at a certain figure, and in the briefest space knocked it down, indicating the fact of the sale merely by a movement of his finger. So rapidly, indeed, were the animals brought forward and disposed of, that in twenty-nine minutes more than £50,000 had been realized." It is proverbial that slow salesmen make slow sales; as the bidders know that auctioneers of all kinds here in England will hang and pester and turn away in make-believe consultation, and do anything to get another guinea offered. It is not quite clear to us but that Mr. Page, clearly a man of original genius in his way, made the sale, as one almost shudders to think how it might have been produced. And, further, how capital is the notion of the lot being sold by "a movement of the finger," instead of that absurd threatening, so continually repeated, to let the hammer drop, or the yet more fallacious business of setting the glass running. Again, there was a stand-up lunch, to which all and sundry were invited, in place of the perfunctory ceremonious common here in England, where the chair is taken by somebody, not because the price of short-horn or knows a South-Down from a Leicester, but because he is a member for the borough, High-sheriff of the county, or the parson of the parish. And of course the customary loyal toasts are given, and the health of "our worthy host," and of his "worthy wife," and of his "dear home land," and of the "able chairman," and of the auctioneer, although everybody will hear quite enough of him during the rest of the day. As we once entered the luncheon tent in company with a famous breeder of stock, he seized on a seat handy to the door, saying, as he did so, "if we sit here we can get out as soon as the speaking begins." Cannot all this sort of thing be reformed, particularly when, with the auctioneer's eloquence, people have often to run for it before the business is over? But things may take a deal of selling, but good sell themselves, and when we come to really crack cattle, let us take example from the stand-up lunch, the stump of the old pump, and Mr. Page's fore-finger. Naturally enough, the English, after the "hang fire" system to which they have been so long accustomed, were somewhat surprised, and one man straightway began babbling in millions. Moral: whether he be offering an estate, a race-horse, a Short-horn, or a sideboard, a talkative "dwelling" salesman is a mistake. 27/10/73

The only comment we have to add to the foregoing is the fact that the "certain figure," at which the several lots were started, was simply the first voluntary bid, and not an upset price, as might perhaps be inferred.

The Short-horn Controversy.

A sharp controversy is now going on in the English agricultural papers about the respective merits of the Booth and Bates families of Short-horns. Relative thereto, a correspondent of the London *Field* says:—

If Short-horn breeding is not to sink into an association of half a score or so of millionaires buying in one another's cattle at fabulous prices to set folks talking, it will be necessary for breeders to look at the pursuit from a wider point of view than that now taken up by purists, and lauded by the press. If all that is to be aimed at is obviously to copy the herd of some dead breeder who earned a reputation, it would seem more rational to adopt the dead man's method rather than to scramble for what are left of his tools in the condition that he left them. To have a right to public sympathy, it would be necessary to show some benefit accruing to the public from the pursuit. To judge by some recent observations it would seem as if some leading breeders thought the object of breeding was to confine an admirable breed of an animal in as few hands as possible.

Both the two national benefactors—the late Messrs. Bates and Booth—tried with such powers as they had (and these were large) to establish a distinct type of Short-horn. Both succeeded, and the moulds they left behind are deservedly much prized. But it should be the object of the admirers of each to reproduce the forms of the animals which won distinction for their original breeder, and not to reproduce pedigrees on paper, varying as little as possible from those which their forerunner left. It is quite well known that the animals which most resemble the original Duchesses have been found in tribes crossed with Duchess blood, but not of Duchess descent, and that cows reproducing the model of Braeclet and the Blossoms, or the four sister Queens, have occurred at intervals in very obscure families which have had the advantage of crosses of Killelby or Warlaby blood. Such reappearances are more to the credit of the owner than animals which, having a pedigree

almost a fac-simile of original Bates or Booth pedigrees, and yet weedy or unsightly. Yet the tendency of the recent sales is to encourage young beginners to neglect the former, and to half ruin one another in a frantic effort to restrict the number of the possessors of the latter. It is a matter of common talk that at some not far distant auctions the best butchers' beasts have scarcely made butchers' prices.

No doubt, for special purposes, "pure" animals have a special value. But it must not be forgotten that the result of "pure" breeding has been that some most valuable families are fewer in numbers now than they were ten years ago. Is this a recommendation to land occupiers to set up for keeping "pure" herds? The object of the land is to feed the people; and the really good stock are they which year by year contribute the largest portion of the best food for English families.

There is a tendency in much that is said and written about Short-horns to obscure the fact that no breed, when really in a natural condition, will milk better, fatten quicker, or give more saleable carcasses than good Short-horns. The Irish and Scotch farmers (both of whom of late years have bred with greater intelligence than their English brethren) have never joined in the hunt after this "pure" will-o'-the-wisp, as we must needs regard it. The English press should encourage the English farmer not to join in flattering the owners of "pure" animals—in the easterly sense of the word—which produce a good many more paragraphs than beefsteaks.

"Pure" cattle are all very well for the few who can afford to run the long-continued risk which pure breeding involves; and for the fewer still who know how to turn to best account such cattle when they have got them.

English Agricultural Statistics.

The following abstract of the agricultural returns of Great Britain for 1873, is furnished officially for the English papers:—

	1871.	1872.	1873.
Wheat, acres.....	3,571,894	3,229,267	3,199,322
Barley, do.....	2,755,793	2,816,512	2,820,020
Oats, do.....	2,713,567	2,799,737	2,670,221
Potatoes, do.....	127,691	161,983	141,023
Hops, do.....	6,029	6,527	6,223
Cattle, number.....	5,237,779	5,221,204	5,261,579
Sheep, do.....	27,119,569	27,921,767	29,127,625
Pigs, do.....	2,479,992	2,771,719	2,500,279

This shows, as to wheat, a decreased acreage of 3 per cent. as compared with 1872, and not quite 2½ per cent. as compared with 1871. The decrease in the acreage of barley is but little short, and in that of oats but little over one per cent., compared with 1872. In live stock there is an increase over last year of 6 per cent. on cattle, about 5½ per cent. on sheep, and a decrease of nearly 10 per cent. on swine.

The decrease in the acreage of wheat is much smaller than had been estimated by leading writers on the prospect of the crop the present season. On the other hand, however, the crop has turned out enough below the earlier estimates more than to make up for the difference. The official statement of the average price of wheat shows an advance of about six shillings sterling per quarter, against the price at the same time in 1872, as follows:

Wheat, average price, September, 1872.....	57s. 5d.
do, do, 1873.....	63s. 2d.
do, do, September, 1873.....	63s. 4d.
Ann. Flour, price per bush, September, 1872.....	29s. 6d.
do, do, 1873.....	31s. 3d.
do, do, September, 1873.....	31s. 3d.

It will be observed how slight are the variations in the acreage of the several crops from year to year, under the definite systems of rotation and culture adopted on British farms—illustrating the fact to which we have often adverted, that English farmers adhere in the main to the purposes to which experience has led them to devote their land, comparatively regardless of ups and downs in prices—depending for their profit upon the general result for a series of years, and not attempting, as is so customary here, to change with every turn of prices from one branch to another. The consequence of our system, or lack of system, is that each branch in turn is overdone; when wheat is high we put too much land into it that the price at once fluctuates to the contrary extreme; and so of Indian corn and pork-making, of wool-growing, dairying, &c. At the same time there appears to be a tendency in English agriculture to diminish (or not to extend) the area in grain crops, in which the competition from other countries is most seriously felt, and to devote more and more attention to the making of beef and mutton, which cannot be imported on so large a scale from the adjacent continent, and still less from America or Australia.—*Country Gentleman.*

English Ram Sales of 1873.

A great change has taken place of late years. Time was when the sheep that sell most readily today were not even known beyond their own locality; when the Leicesters and South-Downs were about the only recognized breeds in the country, and commanded great prices. Now the number of rams sold is comparatively small, and the prices barely remunerative. At Chichester market, a few days since, we learn from a contemporary that Mr. Heasman's rams were unlet, and that others made wretched prices; and from eight to twelve guineas seems about the range of auction lettings of Leicesters. There are doubtless, instances in which more money is made, but the demand is limited in both cases. Let us look at some of the Shropshire sales. Mr. Procco had a great attendance at his first Shrewsbury sale, and most of the lots went off well. Lord Chesham, whose successes in the show yard have placed him at the head of the list, sold and let over thirty sheep at an average of over £40 a head; three animals making 105 guineas, 110 guineas, and 150 guineas. The Messrs. Cranes disposed of a large lot, averaging over £20. At Mr. Coxon's sale two sheep made 100 guineas and 105 guineas; whilst Mrs. Beach's second prize shearing at Hull was let the other day for 200 guineas, the highest price ever made of a Shropshire. Customers from all parts, not only of this country, but Ireland and the colonies, testify to the demand for these rent-paying sheep. Three rams and fifteen ewes have been selected from Lord Chesham's flock, and despatched to Australia; the former at 50 guineas each, and the latter at 10 guineas each. The Hampshire sheep have also met with a ready demand. Ram lambs are principally used, and Mr. Rawlence, of Balbridge, a leading breeder, let two lambs at 75 and 72 guineas respectively, averaging over a large lot 22½ guineas for those let, and 16½ guineas for such as were sold. Mr. C. Dibber, however, stands at the top of the tree, having let a ram for £162 15s. The Lincolns have also sold remarkably well. At Mr. Kirckham's sale, at Discathorpe, sixty-two shearlings made an average of close upon £25, and the older sheep rather more. A considerable proportion were purchased for New Zealand, where the Lincolns are much appreciated. Great prices were made at the Messrs. Dudding's sale, where an average of £20 was reached. Here again large purchases for New Zealand greatly affected the total.—*The Field.*

Portrait of the late Luther Tucker.

The *Country Gentleman* is presenting its paid-up subscribers and exchanges with a beautiful steel engraving, which is a life-like portrait of its late senior editor and proprietor. Our best thanks are due and are hereby tendered for the copy which has reached this office. Slight as was our acquaintance with the original, we detect the resemblance of the picture at a glance. Nor can we refrain from expressing our appreciation of the filial love which has taken this method of showing respect to an honored father's memory, and at the same time giving his large circle of friends a welcome and valuable memento and memorial of him.

North American Bee Keepers' Society.

The next annual meeting of this body will be held at Louisville, Kentucky, commencing the first Wednesday of December, and continuing in session two or three days. Hitherto Canada has had but a single representative at the meetings of this important Society. Will not others of our bee-keepers make an effort to attend this year? It is expected that arrangements will be made for reduced fares on the railroads, and cheap board at the Louisville hotels.

Not having received the expected official information relative to the Ontario Agricultural College, at the date of our going to press, we have no alternative but to delay its publication until our next issue.

We direct attention to the superior cotton warps manufactured by William Parks & Son, New Brunswick Cotton Mills, St. Johns, N. B. These yarns are almost exclusively used in the maritime provinces, and are being successfully introduced into Quebec and Ontario.

Agricultural Intelligence.

Bow Park Short-horn Sale.

Cows and Heifers.

Table listing various cows and heifers with their names, ages, and owners. Includes entries like 'Mrs Miller, red and white, 12 years, J. H. Glennie' and 'Beauty, 4th, red and white, 11 years, Wm. Whitelaw'.

Bulls.

Table listing various bulls with their names and owners. Includes entries like 'Oxford Chief, red, April 1, 1869, Thomas Douglas' and 'Red Knight, red, July 22nd, 1871, C. Burleigh'.

Berkshire Pigs.

Table listing various Berkshire pigs with their names and owners. Includes entries like 'One sow pig under 12 months, John Melving' and 'One do, do, John Melving'.

Mr. Stone's Short-horn Sale.

Cows and Heifers.

Table listing various cows and heifers for Mr. Stone's sale. Includes entries like 'Duchess of York 2nd; roan; Nov. 24th, 1861' and 'Sanspareil 10th; roan; Dec. 12th, 1862'.

Main table listing various cows and heifers with their names, ages, and owners. Includes entries like 'Mormald; roan; 28th April, 1865' and 'Marchioness of Gloster 4th; red and white, 1st June, 1865'.

Bulls.

Table listing various bulls with their names and owners. Includes entries like 'Grand Duke of Cambridge' and 'Sheriff; red; 8th June, 1872'.

Mr. George Miller's Sale.

Bulls.

Table listing various bulls for Mr. George Miller's sale. Includes entries like 'Oxford Duke; Red; calved 9th Sept., 1872' and 'Sire Bell Duke of Oxford'.

Cows and Heifers.

Table listing various cows and heifers for Mr. George Miller's sale. Includes entries like 'Flirt; Red and White; 3rd April, 1863' and 'Blanche; Red; 13th May, 1863'.

Table listing various cows and heifers with their names and owners. Includes entries like 'Duchess of York 2nd; roan; Nov. 24th, 1861' and 'Sanspareil 10th; roan; Dec. 12th, 1862'.

Mr. William Miller's Sale.

Cows and Heifers.

Table listing various cows and heifers for Mr. William Miller's sale. Includes entries like 'Duchess of York 2nd; roan; Nov. 24th, 1861' and 'Sanspareil 10th; roan; Dec. 12th, 1862'.

Mr. John Miller's Sale.

Cows and Heifers.

Table listing various cows and heifers for Mr. John Miller's sale. Includes entries like 'Countess of Ath. 2nd, Wm. Miller' and 'Crested, Wm. Miller'.

Bulls.

Table listing various bulls for Mr. John Miller's sale. Includes entries like 'Count of Oxford, Holt, Underhill, Pickering' and 'Grey Friar, John R. Craig'.

The sheep, of which 21 lots were sold, varied considerably in price, and ranged from \$10 to \$100. Three Berkshire sows were sold, at \$24, \$25, and \$20 respectively.

At the prize show of the Kent and Surrey Rabbit Breeders held on Tuesday, at Walworth, the lop-eared rabbit which won the first prize had ears which measured 23 inches in length, and breeders now produce rabbits with the longest ears ever previously attained. Many other beautiful specimens of rabbits, for weight, color, and carriage were exhibited, and prizes awarded to the owners of the best.

Moreton Lodge and Bow Park Sales.

Two important sales of stock have come off during the present week, which are of interest to all farmers...

At Bow Park sale, though the average was low, very good figures were obtained...

Altogether there is a bright future in the history of these sales...

can possibly afford it should aim to own at least one pair of oxen...

Mr. Pavin Davis' Short-horns.

The man who holds the "champion belt" as the most spirited buyer who ever invested in a cow, is, of course, a person of some note...

It has been a sleeping and waiting, as the Irish song has it, but here on sleeping and waiting, we have a story...

"Kirklevington 17th is a good framed cow, rather low in flesh, but having a rounded form to build her on, and quite Short-horn all over...

fulfillment. It is a cow which has recently been taken with justice for the "champion belt" by the London Advertiser...

Seef vs. Elcod.

A correspondent of the London (Eng.) Field, writes to that journal as follows:

"The extraordinary prices reported from the New York Mills' sale of Short-horns has revived, to a certain extent, the wild talk which on a wild last autumn upon the credit of the cattle...

practice is a better guide than theory. It was not by 4000-gallon balls, or by cows brought across the Atlantic in a balloon, that the average per head has been nearly doubled over the mythical sold yearly at Ballinacree fair, or that the numbers increased tenfold. These English gardeners who occasionally travel (or, happily, a largely increasing number do) may take lessons in reasonable cattle breeding in either of the sister countries; for, in consequence of their climate retarding the growth of cattle production, the Irish and Scotch farmers had their attention turned to increasing the value of the annual draught of steers long before their English brethren, and the use of Short-horn bulls very early prevailed. But these bulls had to be of the pattern which the butchers love; and the amount of paper remuneration could stand for a thin hide, a rail-like frame, and a want of hardiness in appearance. For the bulls had to live on the native cattle feed; and the produce had to fight for a maintenance upon level or mountain side against a winter wind, which blew unrelentingly, and against a summer plague of flies. If Short-horns cannot face the exigencies of the national climate without protection, they cannot really benefit the national stock of cattle; and I would venture to suggest an experiment which would test the superiority of different climates to distinction far better than any question ring.

"It is admitted that two strains have got for themselves, by general consent, a far greater amount of support than all the others. Yet there are far more than two distinct strains of Improved Short-horn blood; as the Lull and Sinking showyards this year very decidedly established. Anyone who visited these, and took the trouble to examine the pedigrees of the prize animals after he got home, found some of the most successful traced back to neither of the fashionable herds, and a few had little blood from either source. And these were scarcely, if at all, inferior to the others in any of the qualifications which go to make up a first-rate cow in the stable; and it can never be too frequently repeated that it is to this fact, as a paper currency to the stock of bullion, that all pedigrees must eventually be brought. If it cannot be shown that the pedigree animal grows on either under natural treatment, or on sponges or natural food, all the newspaper paragraphs about Short-horn intelligence will fail to support the claims of superiority or the representatives of the "Herd-Book" in the eyes of cautious agriculturists.

"But I know that the registered cattle have been found to improve all the local varieties. The half-breeds shown in the different exhibitions clearly establish the truth that every breed gains in size and in earliness of maturity by a cross with the Short-horn. But this cross must be got, not from the most wanted strains, but from animals which will endure the same usage which their produce will have to bear. I would venture to suggest that some gentleman of large means might cause to be reared either two or three scores of half-bred calves, having dozens or half dozens by a bull of one strain, and dozens or half dozens by bulls of the other, and then get similar numbers of the ordinary Irish or Scotch half-breeds, begotten, as they generally are, by Short-horn bulls of mixed but good pedigree upon ordinary cows, and keep the whole together, un-separated, in some large park, open to agistment, and have all wintered alive in some strawyard, as ordinary farm stock are wintered, and then sell, half to the butcher of the second summer's grass, and half to the Christmas markets, ripe fat, when under three years old, and have weights and prices of each lot carefully reported. I am sure such an one would render a far greater service to the whole community than does all the rash talk and rather badinage of such "international contests" as Mr. Campbell's sale has been termed. The public is not interested in such rivalry as this.

"The best of which our nerves are want;
The best, not best, for which we part;
More best, and cheaper, that we want."

The Wheat Crop of 1873.

This is the third season in succession in which I have had to report a deficient wheat crop. The deficiency in the produce per acre of the harvest of 1873 is rendered the more serious since there is not only a somewhat diminished total area under the crop, but a very much larger proportion than usual was not sown until the spring. A wet autumn was followed by a very wet winter, and there was comparatively little opportunity for autumn sowing after October. The early summer, though cold, was not unfavorable, and some fine, dry, ripening weather in July brought on the harvest much more rapidly than

had been anticipated. The weather was also favorable during the early part of August, and in the southern counties a good deal of wheat was carried in splendid condition. But from about the middle of the month the weather became very unsettled, in many localities greatly interfering with harvest operations and damaging the crop. There is, therefore, a great difference in the quality and condition of the grain harvested in different localities this season; the earlier districts being specially favored, and the later having suffered much in this respect.

The following table shows the produce of wheat in 1873 from the same selected and differently manured plots, as usual, in the field at Rothamsted, which has now grown the crop for thirty years in succession. It gives also, for comparison, the produce for each of the preceding ten years, the average for eleven years—1853-73, and the average for twenty-two years—1852-73:—

BUSHELS OF DRESSED CORN PER ACRE.

Harvest.	Without Manure.	Largest Yielded Plot.	Artificial Manures.			Mean of 10 Years 1863-72.	Mean of 22 Years 1852-73.
			Plot 7.	Plot 8.	Plot 9.		
			Mean of 10 Years 1863-72.	Mean of 10 Years 1863-72.	Mean of 10 Years 1863-72.		
1863	17 1/2	44	50 1/2	55 1/2	55 1/2	54 1/2	37 1/2
1864	14 1/2	42	45 1/2	49 1/2	49 1/2	49	35 1/2
1865	14 1/2	37 1/2	46 1/2	47 1/2	44	42 1/2	31
1866	14 1/2	37 1/2	39	32 1/2	32 1/2	31 1/2	25 1/2
1867	8 1/2	17 1/2	22 1/2	30 1/2	29 1/2	27 1/2	21 1/2
1868	1 1/2	41 1/2	21 1/2	45 1/2	47 1/2	44 1/2	31 1/2
1869	1 1/2	22 1/2	28 1/2	31 1/2	39	37 1/2	28 1/2
1870	15	37 1/2	40 1/2	44 1/2	45 1/2	45 1/2	31 1/2
1871	9 1/2	39	24 1/2	27 1/2	34 1/2	32 1/2	25 1/2
1872	10 1/2	32 1/2	29 1/2	35 1/2	40 1/2	35 1/2	26 1/2
1873	11 1/2	26 1/2	28 1/2	27 1/2	30 1/2	28 1/2	22 1/2
Average 1873	13 1/2	36	34	39	41 1/2	38 1/2	29 1/2
Average 1853-73	14 1/2	35 1/2	34 1/2	37 1/2	37	36 1/2	28 1/2

WEIGHT PER BUSHEL OF DRESSED CORN (LBS.)

Harvest.	Without Manure.	Largest Yielded Plot.	Artificial Manures.			Mean of 10 Years 1863-72.	Mean of 22 Years 1852-73.
			Plot 7.	Plot 8.	Plot 9.		
			Mean of 10 Years 1863-72.	Mean of 10 Years 1863-72.	Mean of 10 Years 1863-72.		
1863	62.7	63.1	62.5	62.9	62.1	62.3	62.7
1864	61.0	62.5	63.1	62.5	62.6	62.1	61.5
1865	62.6	61.5	61.6	61.4	61.1	61.4	61.2
1866	61.3	61.7	61.0	60.1	60.6	60.6	61.2
1867	51.1	61.4	61.0	60.7	59.9	60.5	59.4
1868	61.0	61.6	61.1	62.7	61.1	61.4	61.3
1869	53.1	56.9	57.4	57.2	57.1	57.2	56.8
1870	61.7	63.1	63.3	63.0	62.7	63.2	62.8
1871	51.8	62.0	56.6	57.7	53.6	57.6	57.5
1872	53.0	56.7	63.2	60.4	60.0	63.2	63.0
1873	57.0	57.1	58.1	56.9	57.1	57.0	57.4
Average 1873	59.2	61.0	60.4	60.5	60.3	60.4	60.2
Average 1853-73	57.6	60.0	60.2	59.0	58.4	58.0	58.5

* Equal to 51 bushels, at 61 lbs. per bushel.
† Equal to 43 bushels, at 61 lbs. per bushel.
‡ Equal to 27 bushels, at 61 lbs. per bushel.

In my letter published in the *Times* of September 29, last year, I stated that the season of 1870-71 was, for artificial manures, much less favorable; but, for farmyard manures, considerably more favorable than the average; and that, consequently, the calculated average from my produce, which is considerably influenced by the results obtained by artificial manures, would probably give a figure too low for the average produce of the country at large in 1871; while, on the other hand, as the season of 1871-2 was, compared with the average, more unfavorable for farmyard than for artificial manures, the figure derived directly from the experimental results of 1872 would probably be too high for the average yield of the country in that year. A correction was accordingly made, and the imports of the year have shown that the estimate of the average crop of the country so arrived at must have been extremely near to the truth.

In the present season the unmanured produce is higher than in 1872, and considerable higher than in 1871. On the other hand, reducing the produce in each case to bushels of 61 lbs., that by farmyard manure is nearly 7 bushels per acre lower than in 1872, and nearly 13 bushels lower than in 1871; and the mean produce of the three artificially manured plots is more than 6 bushels below that of last year, but almost identical with that of 1871.

Taking the mean of the produce without manure, with farmyard manure, and of the three artificial manures taken as one, we have 22 1/2 bushels of grain per acre,

of 57.4 lbs. per bushel, which, reckoned at 61 lbs. per bushel, represents only 21 bushels. This is from 4 to 5 bushels less than the average taken in the same way last year, and nearly 7 bushels less than the average of twenty-two years. In fact, the produce by farmyard manure and by the various artificial manures agree very closely with that under the same conditions in the very bad season of 1867.

In the following table is shown the produce of twenty-two varieties of wheat, grown side by side, in the same field. The previous cropping had been sainfoin in 1870 and 1871, and mangolds with dung in 1872. The whole of the land was treated in the same way; the different wheats were all sown at the same time, and all were top-dressed with nitrate of soda in the spring, at the rate of 1 1/2 cwt. per acre. For comparison there is also given the produce of most of the same varieties in 1872 and 1871. It should be stated that a different field is taken for this experiment each year, but that each year the treatment is alike for all:—

DRESSED CORN PER ACRE (BUSHELS).

Description of Wheat.	1871.	1872.	1873.
1. White Corn (red)	—	—	40 1/2
2. Rivita (red)	—	—	48 1/2
3. Chiswick (red)	32 1/2	40	85 1/2
4. Red Corn (white)	32 1/2	37	53 1/2
5. Drummer (red)	37 1/2	40 1/2	50 1/2
6. Red Wonder	61 1/2	42 1/2	67 1/2
7. Darvel (old red Lammas)	51 1/2	41 1/2	32 1/2
8. Bristol Red	19 1/2	41 1/2	39 1/2
9. Red Nursery	34 1/2	40 1/2	27 1/2
10. Red Lammas	30 1/2	40 1/2	34 1/2
11. Woolly Ear (white)	31 1/2	42 1/2	37 1/2
12. Harrogate (white)	—	—	46 1/2
13. Golden Broom (red), Harrogate	39 1/2	40 1/2	44 1/2
14. Victoria White, Harrogate	30 1/2	41 1/2	38 1/2
15. Hunter's White, Harrogate	26 1/2	39 1/2	35 1/2
16. Original Red, Harrogate	30	37 1/2	36 1/2
17. White Chiddam	26 1/2	35 1/2	51 1/2
18. Red Proctor	37 1/2	—	46 1/2
19. Grey's White	19 1/2	42 1/2	57 1/2
20. Golden Bough (red)	33	39 1/2	35 1/2
21. Hole's Proctor (red)	33 1/2	42 1/2	45 1/2
22. Club Wheat (red)	35	45 1/2	47 1/2
Means	32 1/2	42 1/2	38 1/2

Of these two varieties of wheat, grown side by side, and all treated alike, the produce ranges 2, 3, or more bushels above, and of many 2, 3, or more bushels below the average of the whole; and there is a variation of about 20 bushels between the highest and lowest produce. The weight per bushel also varied from 60 1/2 to 63 1/2 lbs., the average of all being 57 1/2 lbs. Such results obviously very much increase the difficulty of forming a correct estimate of the produce of the country at large.

Reduced to 61 lbs. per bushel, the average produce of the selected plots in the experimental wheat field in 1873 is about 21 per cent. below the average of twenty-two years. Much of this great deficiency is due to the fact that there was, in all, about double the average fall of rain during the four months of October, November, December, and January; the effect of which would be to wash beyond the reach of the roots a large amount of the nitrogenous manure which had been applied in the autumn. It is established that that most important and costly constituent of manure, nitrogen, especially when applied in the soluble form of ammonia, is largely converted into nitrate in the soil, and is, in that condition, washed away into the drains or the subsoil when there is an excess of rain. The loss of effect thus arising is strikingly illustrated by a comparison of the produce of the two plots, No. 7 and No. 9. Both received the same amount of nitrogen per acre, which was applied as ammonia salts in the autumn to plot 7, and as nitrate of soda in the spring to plot 9. The result was that while the autumn-sown ammonia salts yielded only 22 bushels, the spring-sown nitrate yielded nearly 33 bushels. Again, another plot, which received the same amount of ammonia salts as plot 7, but applied in the spring instead of the autumn, yielded nearly 33 bushels.

The loss of the nitrogen of manure by winter drainage would be the greatest where guano, ammonia salts, or other very soluble nitrogenous manure was sown in the autumn, less where farmyard manures was employed, and less still where wheat was grown after.

As the deficiency on the manured plots this year is greater than it otherwise would be, in consequence of the washing out by the winter rains of the nitrogen of manure chiefly applied in the autumn, and as the unmanured produce, which represents much of the poor and badly cultivated land of the country, shows a deficiency of only about 13 per cent. compared with the average of twenty-two years, I am disposed to conclude that the yield per acre of the United Kingdom will be about, but probably not more than, 20 per cent. below the average.

The agricultural returns, just published, show that the area under wheat in Great Britain was, in the season just past, only about 3 per cent. less than in

The Dairy.

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

Butter Factories.

(Continued.)

In the butter factories about Malone, and in the private dairies where the Jewett pan is in use, it is made an essential point to keep the air in the milk-room at 70°, or nearly, while the milk is reduced to 60° or 62°. This difference between the temperature of the surrounding air and the milk, has some advantages and some disadvantages. It favors the rapid and perfect separation of the cream. The cooling, it will be remembered, begins at the bottom of the pan, and works slowly upward, and for some time the cream on the surface and the top of the milk will be warmer than the milk below. As the cream approaches the surface, and becomes relatively warmer than the milk through which it has passed, it expands and becomes relatively lighter, thus hastening its ascent, and keeping it up when it has reached the surface. The rising of the cream is very rapid in these pans. It was apparently all separated in 24 hours, but we had no means of judging, except by the thickness of the cream as it appeared to the eye. Cooling at the bottom of the pan is more favorable to rapid rising than cooling at the top or sides of the vessel. When cooled from the top or sides, the colder milk settles to the bottom, and currents are formed which, in a glass vessel, can be seen slowly moving up and down, and in different directions. The smaller globules of cream, which are but very little lighter than the milk itself, go with those currents, and are retarded in getting to the surface.

In factories where the air was kept ten degrees higher than the milk, it was plain to be seen that the cream was ripening unequally. The top of the cream was exposed to a temperature several degrees higher than the under side, and hence it grew thick, and sour, and stale, before the under side was fairly up, and was yet sweet and thin. After the cream was taken off, and allowed to stand 12 to 24 hours in large pails, it assumed a more uniform condition, but it was clear to us that less difference between the milk and surrounding air would be an improvement to the quality of the butter.

The rule for skimming in all these factories is determined by the thickening of the cream. The upper stratum of the cream becomes thick in about 24 hours, but the under stratum, next to the milk, will then be so soft and thin, that if the finger, reaching down into the milk, is passed through the cream, the under part of it will follow the finger and spread over the space which the finger made bare. When it gets thick clear through, so it will not follow the finger, it is considered fit to skim, as it will then not run through the skimmer. If the milk is kept at 62° and the air at 70°, the cream will get thick in 36 hours. If it is reduced to 60° the air in the milk-room still being 70° it will require 48 hours to acquire the same solidity. This rule, so general in these factories, could hardly be applied in factories where the milk is set in deep pails, as the bottom would not become thick before the top would spoil; nor would it apply where the milk and the air in the milk-room were of the same temperature.

Another point in the Malone factories is to take off the cream with the smallest possible amount of milk. This is done chiefly to save labor in churning, which it certainly does; but it occasions a loss in the quantity of butter, that is of more value than the extra labor of churning, especially where the churning is done by steam or water power, as in these factories the rising of cream in milk is never perfect. The upper part of the milk usually contains so much cream that it will pay to churn one-

quarter of the sour milk for the sake of the increase of butter it will give. Some have the impression that the more milk there is churned with the cream, the more cheesy matter will be carried into the butter. This impression, though supported by some respectable authority, is founded more on theory than fact. The cheesy taste which butter sometimes acquires, depends upon the imperfect working or washing out of the butter-milk more than anything else. The more cheesy matter there is in butter the sooner it spoils; but it happens that all other circumstances being the same, butter from churning the whole milk, not only is greater in quantity, but keeps better, and has a better grain than that made from churning the cream only, but it falls a little short both in color and flavor. Where there are defects in flavor, as of animal odor, taints absorbed from the air, or acquired from the cows eating strong scented food, the more milk there is churned the more will these defects be removed.

The cream is taken off very carefully, and put into large tin pails, in which it stands till it is churned. The skimming is done night and morning, just before the new milk comes in. As soon as the cream is removed the milk is drained off through a tin tube into the sour milk tank by pulling a plug from the bottom of the pan, which is the only labor required for disposing of it. The milk of 100 cows is put in one pan, and a factory of 300 cows fills three pans at

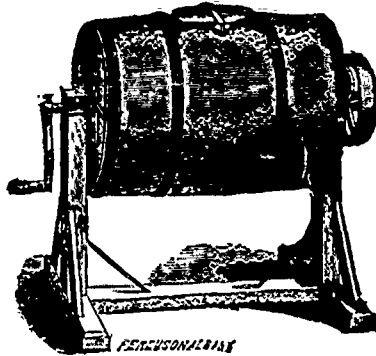


Fig. 1.

each milking, and of course there are three such pans to skim and wash every night and morning. We were in the Cold Spring Factory, in Malone, while the skimming was being done, and were surprised at the facility with which it was accomplished. Two women would skim, run off the sour milk, and wash the pans in 45 minutes easily, the water being ready heated in the steamer or dairy stove. The cream is churned the next morning after it is taken off, part of it standing 12, and part 24 hours, after skimming.

The churning is done, in most of the factories, in rotary churns of the barrel form, that are calculated to hold cream enough to make 100 lbs. of butter. But that quantity is not often churned at once, 30 lbs. being the usual amount turned out of each churn. We give an illustration of this churn, which, with the other illustrations used to-day, has been kindly furnished by Messrs. Jones, Faulkner & Co., dealers in dairy apparatus, of Utica, N. Y.

These churns have a man hole about 8x12 inches, and on the inside are three ribs running lengthwise of the barrel, that are one inch thick and three deep. These serve as buckets to catch the cream and carry it up as the barrel rolls, so that it will drop down and do the churning by striking on the lower side of the churn. These churns rotate at the rate of 40 revolutions per minute, and require an hour to an hour and a half to do a churning. If the cream is thin, or much diluted with milk or water, a more rapid motion is necessary to carry the cream up high enough so that it will fall as it nears the top of the churn. This is deemed the important point in churning; and as the cream is thick or thin, the motion of the churn is made slow or fast, so as to make the

cream drop at the right period. The churning is almost invariably done at 60°, and it is the general practice also not to gather the butter till after it is washed. When it begins to form, cold water enough is put into the churn to reduce the temperature to 58 or 60 degrees; enough, at least, to counterbalance the increased temperature occasioned by churning. When the butter has all come, and is gathered into lumps the size of peas, the butter-milk is drawn off, and water introduced till it is freed entirely from butter-milk. It is sometimes washed in large wooden bowls or trays, and sometimes on the butter-worker.

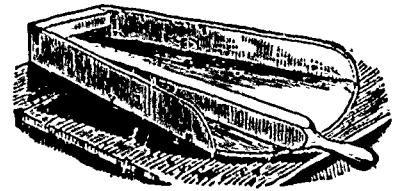


Fig. 2.

When so washed it is taken from the churn while in a granulated form, as it is more easily and perfectly cleansed of butter-milk before gathering.

Butter-workers of the form seen in figure 2, are in use, but they generally use two levers instead of one, as represented in the cut. They are made of birch plank; are about 4 feet long and 40 inches wide at the front end, and 30 at the other, and 28 inches high at one end, and 18 at the other, with sides raised 4 inches. The levers are of different forms, being 4, 6, or 8 sided, and 3½ inches through, and 5 feet long. Such a worker is large enough to work 100 lbs. at a time, and accomplish the work with great rapidity. A man with a lever in each hand will work, wash, and salt 100 lbs. in 20 minutes, so it will be ready for packing. In Orange County, a lever of the form seen in figure 3, are more commonly used, and are much approved for their efficiency and convenience.

The salting is done on the worker. The butter is spread out thin and the salt sprinkled on, and worked in with the levers. Finely ground Ashton and Onondaga factory filled salt are used at the rate of 1 lb. to 16. Sometimes 1 lb. of salt to 18 lbs. of butter is used. As soon as the salt is thoroughly worked in, it is packed at once in tubs and placed in the cellar. The tubs are made of spruce, are widest at the top, and hold about 65 lbs. The covers are made with a rim like a cheese-box cover, and were generally made of basswood. The tubs are prepared at some of the factories by soaking in cold water two days; at others, by soaking and scalding with boiling

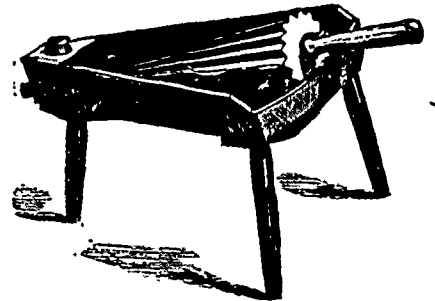


Fig. 3.

water. Before packing, salt is generally rubbed on the bottom and sides. The butter is firmly pressed in with a wooden pestle, till the tubs are filled to within about an inch of the top. Then a piece of fine bleached muslin is spread over the top, and the tubs filled up with salt of the same kind used for seasoning the butter. No coloring is done at any of the factories, which is a fact very much to their credit. The practice of introducing foreign coloring matter into butter never adds anything to its merit, and seldom fails to do positive injury. The color of butter in these factories is regulated by the influence of light. The exact amount of light which contributes to the best shade, has been ascertained by experi-

ment, and just that amount is admitted, and this has been found to be the smallest amount of light, coming from a northern exposure, with which one can see to read. The color of all the butter seen was uniformly good.

The daily make of butter in these factories is seldom weighed separately, so that in only a few instances could we ascertain the precise amount of milk required for a pound of butter. It is known just how much the tubs hold, and they being of the same size, afford a sufficient guide for the manufacturer to salt by. Taking the average weight of a tub as estimated, and comparing it with the weight of milk received, it appeared that 20 1/2 lbs. of milk were being used for a pound of butter. September 1904, the Cold Spring factory, Madison, made 1701 lbs. from 4900 lbs. milk, getting one pound of butter from 22.63 of milk. In some other instances less was required. When the season is complete we shall have a full report of results. When we shall be able to give precise figures. Last year the Berry Factory, Malone, made 1 lb. butter from 21.23 of milk. Union Factory, Pappoe, 1 of butter from 22.20 " Duranor, " " " " " 22.07 " Barley Spg " " " " " 22.61 "

The year previous, the following was reported to the American Dairymen's Association as the result of the whole season:—

Union Factory	1 lb. butter from	21.53 milk
Barley Spg	" " " "	22.55 "
Cold Spring	" " " "	22.61 "

These are the best average results ever met with that have covered so long a time and such large operations. Occasional instances are found where less milk has been required; but in dairies and in creameries where all the cream is obtained that can be, the average is from 22 to 23 lbs. of milk for one lb. of butter.

The butter in all the factories visited was excellent, but none of it was strictly first class. Some of the little defects which have prevented their reaching that high standard have already been pointed out. The chief of these was cooling the milk too soon, thus condensing and retaining the peculiar odor of new milk in the cream and butter, by which it is rapidly hurried on to rancidity and decay. Perhaps the most important defect relates to the circumstances of packing. The tubs in which it is packed are all made of spruce, a timber which is as free from sap, and imparts as little flavor as any other. But it has something of both, and if they are not removed before the butter is put in them, it will be sure to absorb whatever flavor they contain. Water will remove a part of it. Hot water will take out more than cold, and brine will dissolve out what water will not touch, whether hot or otherwise. Cold brine is slow in its action, and will require weeks to effect as much as it would do in a few hours if hot. Boiling hot brine is the only thing that will render wooden vessels safe for the contact of butter. First soak in weak brine, or hot water, for two or three days, and then finish by lining the vessel with boiling hot brine, letting it stand till it becomes cold, and the sap and flavor will all be removed, and the pores of the wood filled with salt, so that it will become impervious to air; and butter will then stand in it as safely as in glazed earthenware. To remove the sap is not enough. The pores of the wood must be filled in some way to prevent the air from working through them and coming in contact with the butter, otherwise it will be sure to receive injury, after a little, next to the wood, and finally involve the whole contents. These facts seemed either not to have been understood, or to have been neglected by those connected with the butter factories, for every tub we tasted was affected next to the wood, more or less, according to the time the butter had stood in it. Detriment was also occasioned by the use of pine-wood covers to the tubs. That variety of timber is unfit for such a use. It has a peculiar odor that is

readily taken up by butter, and it is difficult to remove it from the wood because of its great inclination to swell when soaked. Some inodorous wood, like white oak, is better for covers.

Another practice prevails in packing butter in the Franklin factories which is unfavorable to long keeping, and the perfect preservation of flavor. All tubs are made to cover the top of the butter with a cloth, in order to prevent latter from deteriorating, by coming in contact with the air. The cloth and salt do this partially, but not wholly, and the tubs ought always to cover the top of butter for any length of time. If, in addition to the cloth and an inch of salt, as now used, a layer of fine enough was turned on to reach half way up the tub, the butter would be perfectly protected from the air, and well guarded against variations in temperature and outside odors. If, then, it is covered with a mething to shut out the light, (a light-proof paper, because it imparts no flavor, and is perfectly odorous) it will be in a good situation, so that packing is concerned, to keep sound.

In pointing the defects which appeared in this new method of butter-making we do not wish to underrate or detract attention from its better features. Attention has been called to them only for the purpose of pointing out for our readers' points which we know are essential in making first-class goods. We regard the new system, with all its imperfections, a decided success. It has improved the common make from 5 to 10 cents a pound; increased the quantity from a given amount of milk; and reduced to a minimum the labor of manufacturing. It has made the production of butter more profitable than cheese. By using the Jewett pans, a man, with one woman's help, will run a factory of 430 cows, and make the butter, furnishing everything, for 4 cents a pound. It was made at first price in a factory of 25 cows. The butter is now worth 25 cents, or more. Putting the value of four milk of 2 1/2 times the value of whey, the four milk from 2 700 lbs of milk, the amount required for 100 lbs. of butter, would be worth \$2.80; and deducting \$1 for making and furnishing 2,300 lbs of milk, will net \$3.63.

The same milk made into cheese, taking the average from last year's reports, (2.63) would make 233.23 pounds of cheese, which, at 15 cents, would be worth \$3.50, and the cost of making and furnishing at 1 1/2 per hundred would be \$1.03, making the milk net when made into cheese, (adding 5) cents per 1,000 lbs of milk for the value of whey, \$1.15; \$27.39. Difference in favor of butter \$6.44.

Auvergne Cheese.

There is a cheese made in the mountain region of Auvergne, in France, which is much esteemed, and of which the process of manufacture is peculiar.

The milk is immediately after being drawn strained into the tub and treated with rennet. The curd is not broken until it is translucent and firm, "like a well-made gooseberry jam," but it must not be allowed to stand until the whey separates of itself. The proper point is generally reached within an hour and a quarter. The operator then takes a spatula consisting of a circle of wood with a rising shaft and a straight wing. It is placed in the vessel and rapidly whirled to and fro until the curd is completely broken and granulated. The whey is then carefully decanted into a copper, which is made of wood, and has a handle attached to its bottom. During this part of the process the curd must be disturbed as little as possible. When it is well freed of whey it is put into a draining-tub which stands on the cheese-table. It now undergoes a somewhat remarkable process. The "vacher," with his sleeves rolled to the shoulders, and his trousers turned up to his thighs, goes on his hands and knees and pees away at it for at least an hour and a half—the idea prevailing that the warmth of the body gives quality to the product. Let us hope that he is not only warm but washed! There is a saying in Auvergne, "He is a bad workman; he don't use his knuckers enough." When the curd has had this savory manning it is put into a tub and allowed to ferment during forty-eight hours, being placed near the fire if the weather is cold. Under the influence of the fermentation the cheese becomes spongy. It is then carefully granulated, salted, put into the mould and pressed. During the pressing, which lasts twenty-four hours, it is several times turned. It is then put in the cellar. Here it is carefully attended to, wiped frequently with a damp cloth, and kept until it acquires a ruddy color, which indicates ripeness. The best esteemed Auvergne cheeses are those which are made on the springs of hot water where the cattle are driven to the mountains for the summer. The cellars used are underground, with no opening save a door to the north.—American Agriculturist.

Breeder and Grazier.

A New Yorker's Views on Pigs.

During the recent New York State Fair, according to custom, several evenings were devoted to agricultural discussions. On one of these occasions, the subject was "pigs." It was introduced by Vice-President Curtis, who, in opening the first division of the discussion, alluded to the vastness of the capital engaged in pig raising, it being estimated that there were 22,632,650 swine in the United States last January, valued at \$133,729,615; and in this State alone there were 631,700, worth \$5,631,627; the business is also fast increasing. Yet pork raising east of Ohio is not really profitable, unless to a limited extent in the hands of skillful farmers. It could be made more profitable by paying closer attention to breeding, and exercising more care and economy in feeding. As to breeds, the wants of the western farmer are quite different from ours. He wants as large a hog as possible, without reference to the quantity of food consumed, it being cheaper to ship pork than corn. A breed has been established to meet these requirements—the Poland-China, which are heavy, spotted in color, and have been developed from crosses, first with the Berkshire, which was a decided improvement. The Poland-Chinas have been bred so carefully that they may be called nearly or quite the rough-bred. Another new breed has been started in Jefferson county, N. Y.,—the Cheshire, white in color. These two will suit the western farmer; and the large Yorkshires are also good, but there are very few of them. In the East, we want something quite different—a hog that produces not so much masses of pork, as the heavy hams, shoulders, and fat. There are several breeds of this kind—the Suffolk, which is white; the Berkshire, black and white, and the Essex, black. These make up the list of thorough-bred swine in America, though there are several valuable families which may become breeds in careful hands—the Chester Whites, for instance. We want especially a white hog, with desirable characteristics in other respects, the Suffolks being considered too small (though the speaker thinks none more profitable in proportion to the food consumed), while the Chester Whites are only bred to a very limited extent; they have had some popularity at the West, but have been bred so carelessly as to get mixed up with other kinds, and become unpopular. This has also occurred to some extent with the Cheshires, so that different specimens are exceedingly unlike. Pig breeders are remarkably careless, though attention to the breeding will pay as soon and as well as with any other class of domesticated animals. The color is matter of fancy, for if black pigs be well fattened and well dressed, their pork will not be black. A breed which will fatten readily and early, make a large quantity of flesh in proportion to the food consumed, and grow to a reasonable though not enormous size, is best suited to the wants of the West. As to breeding pigs, it must be borne in mind that no breed of any kind of animals can be kept uniform without a well defined standard of characteristics as the breeder's aim. Swine breeders have for the most part neglected this law altogether, and hence we have no distinctively American breed, as we might and should have. An excellent guide is given by the scale of points adopted by the National Breeders' Association at Indianapolis. As to feeding, there is often a great waste. Food, to be economical, should generally be cooked. In conclusion, Mr. Curtis remarked that it will not pay the eastern farmer to keep a great many pigs, but to have a few of the best kinds, and feed them well.

Fall Treatment of Sheep.

It is customary to give sheep the run of the fields till the snow cuts off their support. And even after that we often see them pawing up the snow to get at the grass. The result is, almost invariably, that the sheep go into winter quarters in a reduced condition. It requires then extra feed to bring them up again—grain at that; and grain is not generally a profitable feed for store sheep, or at least is less profitable than other cheaper yet nutritious fodder. When the fall rains come, cold and often soaking; and later, the snows, damp and chilling, a ill worse, shelter should be prepared for sheep—indeed they should have access to shelter the entire summer to avoid the heat as well as the spring and fall rains—and if they do not readily take advantage of it, they should be made to occupy it and feed there. Nothing is so good to feed as early-cut clover hay. If secured,

as it should be, when just in blossom quite tender, it will be relished; and thrown to sheep often and little at a time, they will eat it up clean; it will answer much the purpose of grass, so that there will be, in effect, no break from grass to hay. If the hay has been damaged in the harvesting, some additional feed will be required, such as meal, roots, etc. The point is to avoid the rains—which drench often to the skin, causing the animal to shiver and suffer, take cold and engender disease—and to get the flock to go into winter quarters in good strong condition. Especially should the young sheep (tegs) have this care given them, as the severity of the fall and winter weather is now to them, and they are more tender than the old sheep. Aftermath is an excellent food for them, and can yet be secured, the season growing it well. By feeding this, or early clover hay well cured, nothing more is needed during the fall and winter. Tegs will grow the whole winter through on this alone, and come out hearty and valuable in the spring. This can be relied on as we know by experience; but the grass or clover must be secured well and when tender, so that it is relished and its substance made available. No food is so healthy as this, the natural feed for sheep and cattle. While we are writing this, in the latter half of August, a long, slow, cold rain is falling, wetting the fleeces of the flocks, to remain wet for a day or two, or longer, should the rain continue. At the same time there are sheep that we know of that are safe under cover, chewing their cud in content, or at leisure are feeding on the fresh green hay provided for them. When the rain is over they will go out dry and lively, a contrast to their fleece-soaked neighbors. Care, as applied to stock, is getting to be understood more and more, it is an element of vast importance, second only to feeding itself. It is, in effect, feed, requiring the less where the treatment is good, and vice versa. What applies to sheep holds good more or less with other stock.—*Cor. Utica Herald.*

Mutton Sheep.

The taste for mutton is growing among American consumers of meat. Farmers, too, are learning that a fat sheep is a very convenient source of meat during the summer season, instead of the hitherto inevitable salt pork or bacon. Besides, spring lamb, with the early green peas and asparagus makes a dish for the farmer's table equal in delicacy to the roast pig of Charles Lamb's Chinaman. But yet, with all this, our fat sheep and spring lambs are not successes. Occasionally we raise a few that are passable; but the market reports show that the Canadians beat us in the quality of the sheep they send to market. The best mutton and the heaviest lambs come to us thence. Why this is thus, is worth investigation by those who make a business of keeping flocks. On the face of it there are two good reasons for this state of things. First, the Canadians raise wholly mutton sheep, grade Lincolns, Leicesters and Cotswolds. These are their specialties. Second, they raise roots. This is the key to their position. Without roots they could not raise that class of sheep. Every Canadian farm has its field of roots as we have ours of corn. We keep a class of sheep productive wholly of wool. Wholly is used advisedly, because the flesh of the merino and grade merinos is not worth calling mutton. From them we raise small but very fat lambs which are marketable early; but their earliness and fatness are their only conspicuous qualities. We feed these sheep on hay and corn; a sort of food which fattens them, but causes a disordered condition of body, which shows itself very often by cutaneous affections and premature shedding of the wool. "So bad begins, but worse remains behind," for the proverbial carelessness and poor business tact of farmers leads them to permit their ewes intended for market to run with the rest of the flock and become with lamb. This is an unpardonable error and tends to disgust a mutton eater with the name of "native sheep." If our farmers would raise mutton that deserves the name, all this should be changed. They must raise roots as well as corn. The corn stubble should be prepared for a root crop by a fall plowing, or at least a double ploughing early in spring, an abundant manuring, and the crop when sown must be well cultivated. Directly and indirectly it leads to profit; and with roots to feed with, and the blood of the heavier sheep mingled with our native flocks, in a short time we could produce equally good mutton with our neighbors across the lakes. Then the sheep intended for market should be kept in a flock by themselves and not be permitted access to the rains.—*New York Tribune.*

Feeding for Wool.

The *Vermont Farmer* says:—The foods which contain the most albumen make the most wool when given as food for sheep. A glance at the following table will show this:—

1,000 lbs. of potatoes, raw, with salt, make.....	6½ lbs. wool.
1,000 lbs. of mangold wurzel, raw, make 5½ "	" "
1,000 lbs. of wheat.....	" 14 "
1,000 lbs. of oats.....	" 10 "
1,000 lbs. of rye, with salt.....	" 14 "
1,000 lbs. of rye, without salt.....	" 12½ "
1,000 lbs. of barley.....	" 12½ "
1,000 lbs. of peas.....	" 16½ "
1,000 lbs. of buckwheat.....	" 10 "

From this we see that peas, wheat, and rye, which contain the largest per centage of albumen, produce the most wool, giving 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 some potatoes or carrots, or green food.

The Prize System.

The *Mark Lane Express*, in an interesting article on the relations of the prize system in the cattle yard to the price of meat, gives the following graphic story of the career of a prize ox: "There was dropped at Riddingham, some five or six years since, a Short-horn bull calf, which its owner, Mr. Edward Wortley, thought to possess the promise of a prize ox. Accordingly he was put up, and in the winter of 1871 took a prize at Oakham, and another in the tenant farmers' class at Birmingham. The steer, however, was pronounced good enough to 'go on with,' and instead of being sold to the butcher was sent back to Uppingham for another year's high feeding. In 1872 he had a very successful career about the country, again winding up at Birmingham, where he was the first of his class and the best of the Short-horns, when we thus wrote of him: 'This well-known ox has not gone on the way of making up, and we fancied him less than when we saw him at Lynn in the summer.' In fact, he looked to have had enough of it. His hour, however, was not yet come, for at 4 years and 7 months old, The Count was purchased for, it is said, 100 guineas, by Mr. Senior, a Buckinghamshire grazer, still to go on with; and exhibited once more at Kettering last week, where he was merely commended, that is to say, as many as three other beasts were placed above the 100 guinea ox. According to one of our best judges 'he strikes you as being tired of rich living, and has lost that nice blooming appearance he once had. He has grown patchy, and not put on his flesh at all level, particularly on his back and shoulders.' Can anything tell a plainer story than this? At 5½ years old the Short-horn is not by any means so good as he was at four, or as he has been declining for the last year and a half, sick and surfeited with over-feeding. Of course, the only reason for his being kept on further was with a view to some of the champion premiums of the year; and at the Smithfield Club show he will probably be exhibited—age 5 years and 7 months—a very marvel certainly of early maturity and cheap meat, of profitable and not excessive feeding."

A Good Yield.

The writer owns a cow, six years old, of the Short-horn breed, a cross of the Oxford tribe on the Princess, said cow is a deep red, and dropped her calf the 23rd of March; does not give a full flow of milk until about ten days after dropping her calf. She was fed daily what hay or cornstalks she could eat, after the first of April until the tenth of June; and in addition, four quarts of Indian meal and oats ground together, in the evening, and four quarts of wheat bran in the morning. That was her daily feed until the tenth of June, when the meal and bran were discontinued. Then she was turned into a clover field of about six and a half acres, whereon stands forty or more large apple trees. The clover had begun to blossom nicely, and as the blossoms increased, the cow's milk flowed bountifully. Her yield of milk during the months of April and May was 40 lbs. daily. The first twenty days of June she gained 17 lbs.; 14 lbs. of it was gained after the 10th, when the meal and hay were discontinued, showing conclusively to the mind of the writer, that red clover in full bloom is conducive to a fine flow of milk.—*Cor. Country Gentleman*

What is a Good Cow?

Messrs. Editors:—"Selma" asks a knotty question: "Does it cost all the extra butter to get the extra feed?" This goes to the very gist of dairying. It is an idle pleasure to draw in fancy the picture of a beautiful cow; to be able to tell which is the most profitable beast, is quite another thing. To my mind the question of a cow's ability to produce butter at a profit, depends upon three conditions:—1. The economy with which the food is purchased and manipulated. 2. The ability of the cow to convert her food into rich milk. 3. The price obtained for the butter.

It needs no argument to prove that no cow can save a man who buys or grows feed at extravagantly high prices, and feeds in a wasteful manner. Upon the second condition my experience runs thus: I soil a herd of twenty Jerseys; am necessarily thrown with the cows a great deal, and have made a study of their appetites. I feed, within reason, *all they will eat*. My four largest eaters are Libel, Pansy, Mabel and Beauty. Effie is a very large cow and a heavy milker. Pansy is of medium size and a heavy milker. Mabel and Beauty are medium milkers and a little above the medium in size. Sea Shell and Lady are the two smallest cows in the herd, and largest milkers and *smallest eaters*. With me, cows having all they will eat, the amount of food consumed is no criterion of the amount of milk or butter returned. A cow has several uses to which she can put an immense amount of food, and to compare her to a mill that knows but one duty is a little misleading. If a cow is a good hand at converting food into rich milk, the more she swallows the better for her owner, provided the first condition is complied with; but if she has other uses to which she will put her food, then the less she swallows the better.

As to the third condition, of course, if a good quality of butter is not made, and a first-class price obtained, the profit is again in peril.—L. S. HARRIS, in *Country Gentleman*.

The Butcher Thought Well of it.

The *Farmer's Advocate*, in speaking of the \$27,000 heifer calf bought by A. J. Alexander, of Ky., at the New York Mills sale, says:

"A funny story is told in connection with this calf. A butcher who has been buying calves for the lovers of veal in Utica at \$4, \$8 and \$5 per head, got his eye on this plump, sleek creature without being told its value. Supposing it would be sold with the beef cattle, he called upon Senator Campbell and said he liked the looks of this calf, and was willing to pay a good price for it. Would the Senator give it to him for \$12! The Senator smiled at the offer but said nothing. That butcher was at the sale yesterday, and he was astonished.

"A little calf which followed its mother was valued by a Canajoharie butcher at twelve shillings when he first saw it. When it was bid off at \$1,300, this verdant butcher opened his eyes, put two extra turns of his shoe-string around his calf-skin wallet, and stepped back from the ring."

Effect of Extra Food.

The *Farm and Fireside Journal* thus summarizes the results of some experiments in feeding pigs:—

During the warm weather two and one-half pounds of extra food produced one pound live weight. This would be a most extraordinary result if applied to all the food taken by the pigs; but they had all the good grass they could eat, and this food supplied the waste of the system, the animal heat, and kept the pig growing moderately. and this extra food was used solely to lay on flesh. Here is the secret of high feeding. The extra food digested all goes to profit, whereas the food that supplies animal waste produces no gain in flesh, and if no more is fed than to supply waste in the young animal, the food is all thrown away. Full feeding is the only profitable feeding, and this leads to early maturity and early profit. The most profitable feeding of pigs is before they are ten months old. No profit results in keeping pigs to eighteen months and two years old, except for breeding purposes; and besides, these eighteen to twenty-four months hogs do not generally average more than \$50 to 400 pounds, live weight, and \$50 pounds may be reached in ten or twelve months. Many millions of dollars' worth of grain is thrown away every year by half feeding or feeding principally in cold instead of warm weather.

Miscellaneous.

Sugar-Curing Hams.

About a million sugar-cured hams are put up in Chicago alone. The art of curing them, and their successful packing for preservation, require so much care and skill that an expert manager readily commands \$250 per month for his services.

Bureaus Without Knobs.

The Boston Commercial Bulletin says if there is ever a man that is anathematized by the travelling public, it is that stupid, thoughtless ass who makes bureaus without knobs to the drawers.

Fitting Collars to Horses' Shoulders.

It is very important to have a collar fit nicely and snugly to the shoulders of a horse. It enables him to work with a great deal more ease, and to apply a great deal more strength.

Hames so adjusted at the top and bottom as to fit the shoulder, and then put the horse to work. The collar, being wet, will adapt itself to the shoulders, and should dry on the horse.

A Poetical Harvest Report.

A Brenham (Texas) correspondent of the Galveston News says:—"Obsarvin' that your corrspondence in these parts confine thurselves mostly to sober prose, and hein' a little of a poick myself, I thought I woud send you a few lines as a specimint.

You want to know about the crops Up here whar the subscriber stops? Well, now! If anybody knows, He wears about my stilo of clothes.

We've had a lectle too much wet, Dut mobbo we may ketch up yet; Old Sol has lately made it toil, And things is looking purty well.

I think on cotton we are sound, If the worm don't come cawrtin' round; If insects off the plant will stop, We'll hev, I reckon, an average crop.

Corn, you say? Yes, corn. Well ther, Old hoss! I'm ready now to swar We've got a let'le the biggest cont You ever seed since you was born.

I tell you, and you bet your pile, That corn grows hefty on our silo; It's done its level best this year, And the biggest corn on earth is here.

It's airy yet to profess— Next month may give my words the lie; But this I'll say, from what I see, That want and famino can't slicer me.

Yours trewly, Dick Season.

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