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The Field.

About Potatoes.

At the last monthly board meeting of the Toronto Electoral Division Agricultural Society, after the appointment of judges for the next exhibition and the transaction of other routine business, the following paper was read by Mr. John Paxton, of Brockton, and a vote of thanks unanimously accorded for it. We have pleasure in acceding to a request for its publication in our Field Department:—

"The potato was first described by Casper Beaubien a short time previous to 1599. But it is to Sir Walter Raleigh that we are indebted for the introduction of this now invaluable tuber. That gentleman established a colony in Virginia about the year 1586. From thence he soon after carried home the potato, and cultivated it on his own estate in Ireland. It did not, however, attract much attention, or come into general use for nearly a century afterwards. During the reign of James I it was considered a great dainty, for it is recorded that during the year 1619 some were bought for the royal table at one shilling per pound. The potato in its wild state is found on the western slopes of the Apennines. Though it was brought to Ireland about 1586-97, it is said to have been introduced into Spain previously to that date, and disseminated by the Spaniards throughout France and Italy.

It was, however, from Ireland that it found its way into Holland and Germany, and thence throughout Europe. In Asia, to this day, the potato is unknown, except where colonies of Europeans have established themselves. The climate of Australia is said to be extremely favorable to the culture of the potato; that is fortunate, as that fine country produces no esculent farinaceous root, if we except the roots of the edible fern (*Pteris esculenta*), which you will allow must be but a miserable substitute for a good potato.

In the beginning of the eighteenth century, a colony of Scotch Presbyterians, who had previously settled in the Province of Ulster, Ireland, but had failed to find that civil and religious liberty which they so much desired, emigrated to America and landed at Boston, bringing with them the first potatoes introduced into North America for culture as a field or garden crop. Hailing from the Emerald Isle, those colonists were called Irish, and hence the name 'Irish potatoes,' by which they are almost universally distinguished in this country from the sweet potato (*Dioscorea batata*), the latter being quite a distinct genus from our '*Solanum tuberosum*.'

In the year 1825 the crop was attacked by a disease called 'curl,' which caused the leaves to shrivel up and finally to fall off. The plant being thus deprived of the only apparatus by which it

could secrete those gases from the atmosphere which are so essential to the perfecting of the tubers, yielded almost nothing. From that time, the plant showed symptoms of disease, more or less, until the year 1846, when it was well nigh swept from the face of the earth by that fell disease, the effects of which show themselves to the present day. Thousands have tried to solve the problem, but so far all their well built theories have only proved castles in the air. Last year Earl Cathcart generously gave a prize of £100 for the best essay on the potato disease and its remedy; but though 90 competed, not one of them fulfilled the necessary conditions. Some of their statements were botanically incorrect, and none of them left the beaten track already well known to agriculturists, so that the prize was withheld. Such men as Mr. Paterson, of Dundee, Scotland, and the Rev. C. E. Goodrich, Utica, N. Y., left the deeply worn rut of theory, and like sensible men struck into the practical to find out a remedy, and have happily succeeded. Mr. Paterson was of the opinion that as animals were only calculated to serve their generation, it must be so with the potato plant, and that without a renewal every generation from the seed ball, it would so deteriorate either from disease or sheer exhaustion, as to become utterly valueless. Acting on this principle, he procured sets of all the healthiest varieties he could find, and planted them together. The bees and other insects carried the pollen of one flower to that of another, thereby infusing fresh blood into the seed vessels. The seed thus impregnated was sown, and the produce selected and tested year after year. The result of the experiment is that Mr. Paterson has given to Britain the "Victoria" and many other varieties, of first rate quality and free of disease. The farmers awarded him a gold medal for his labors, which he well deserved.

The Rev. C. E. Goodrich has given us, by a similar process, among others a seedling of 1853—the Garnet Chili—a valuable variety in itself, but still more so on account of its being the progenitor of our very best varieties at the present day.

The new varieties, if we are to believe the extravagant nonsense in some of our seed catalogues, are legion, and all that can be desired as regards quality, &c. One of these catalogues, in describing a new sort, says, "Thousands have testified that they never ate a better potato," and yet they immediately stultify their statement by saying that "this variety is now offered to the public for the first time, and all for a dollar per pound; C. O. D. Messrs. Buss & Sons, seedsmen, N. Y., last year offered \$3.00 in prizes for the greatest yield from one pound of the Early Vermont," and one pound of Compton's Surprise. The result was, that the 1st prize went to Minnesota for Early Vermont, for a yield of 609 lbs., or in round numbers, an average of over 1000 bushels per acre. The 1st prize for 'Compton's Surprise,' went to the same state for a yield of 511 lbs.

I believe that after a careful selection with an eye to quality, productiveness and immunity from disease, only three varieties are actually worth cultivating. At all events the following three have been thoroughly tested and have proved themselves the most valuable varieties. No. 1, Early Rose, a seedling from the Garnet Chili, originated by Albert Bresee, Vermont. This variety is too well known and appreciated to require comment on my part. No. 2, Peerless, another of Bresee's seedlings, raised from the same seed ball as the Early Rose. This is a splendid late potato, and destined to supersede all others. No. 3, Garnet Chili, the parent of the above two. The flesh as white as snow, mealy and finely flavored, very popular in our market, a good cropper—readily yielding 400 bushels to the acre in good soil. There is a spurious variety of a coarse earthy flavor often palmed off for the genuine.

A wet soil, a humid atmosphere, and raw un-fermented manure, will undoubtedly predispose the plant to the attacks of disease. A light sandy loam, with a fair quantity of well decayed manure ploughed in the previous fall, will grow potatoes of first-rate quality, and little liable to disease. It is a fatal mistake to plant too deep or too close, for solar light and heat are indispensable to the welfare of the crop. Large sets are preferable to small ones, for this reason that large tubers have large buds, which latter contain the embryo crop, and hence it is only reasonable to suppose that the buds which produce the strongest stems and leaves will produce the largest yielding tubers. Small sets only produce small stems, weakly shoots, and of course an inferior crop. The practice of breaking off the prominent buds in the spring is a bad policy, leaving only the tertiary or secondary shoots to produce the future crop. This impairs the vital principle of the tubers to a far greater extent than many would imagine.

A new enemy to this vegetable, in the shape of the Colorado bug, has made itself known to farmers during the past year; in fact, it nearly devoured my own crop, notwithstanding Paris green, &c. But entomologists tell us to keep our minds easy for the future; that it will soon run its course and disappear, pursuing its onward and devastating career to parts at present unknown."

A POTATO-SOWING MACHINE.—The *Journal d'Agriculture Pratique* states that among the new machines which especially attracted the attention of agriculturists at the recent meeting of the Palais de l'Industrie was a potato-sowing machine, invented by M. Cousteau, and constructed by M. Peltier, jun. By means of an ingenious contrivance, worked by a gear, the tubers, previously placed in a box, are carried successively into a pipe which opens and shuts automatically, depositing the seed with perfect regularity in the furrow made by a share with which the machine is provided.

How Plaster Acts.

Wallace Orcutt, Savona, N. Y., writes: "One year ago last fall I rented out a piece of ground for one crop for money rent, and the man sowed winter wheat, the ground being gravelly, or more properly stony. Toward spring I concluded to seed it with clover and timothy, and thought it would need some plaster. I told my tenant I would pay for the plaster if he would sow it; but to my surprise, he replied that he did not think it would pay him to spend the time to sow it just for the benefit it would be to the wheat, as he was not interested in the seeding. Since that time I have conversed with several farmers upon this subject, some claiming that plaster does not benefit winter wheat. Now in our locality the soil is naturally dry and stony, and consequently we are not likely to get a large growth of straw. What I wish to know is, does gypsum benefit winter wheat, if sown in the spring, or if it does benefit it, can it injure it in any way by rusting the straw, or anything of that kind? Another point in regard to gypsum that I would like to see "aired" is, does plaster exhaust the soil in any way? I know one man who has paid for a farm and raised a family—and therefore must be quite a successful farmer—who firmly believes that plaster will eventually exhaust the soil if applied every year in succession. If plaster merely retains the escaping ammonia, as we believe it does, or if it imparts any fertilizing properties, I don't see how this can be the case."

Plaster acts in the most conspicuous manner upon clover and other broad-leaved plants. Its manner of action, chemically considered, is a disputed point. It is sufficient, however, for us to know that it has a special value upon certain crops and soils. Wheat is not one of these crops, and yet in some cases this crop has been benefited by an application of plaster, probably because the soil was deficient in lime, in which case common lime would have answered the same purpose. Plaster, however, would never injure a crop of wheat, because if the soil or crop did not require its help the plaster would simply remain inert, as so much sand or other unnecessary matter might do. As to the exhaustive properties of plaster, the facts are that any special fertilizer, such as this, is only a stimulant, and helps the crop to appropriate more nutriment, and grow with greater vigor in consequence. In exactly the same way, a person might take exercise as a means of invigorating his physical condition. The consequence would be that his appetite would be increased or stimulated and his digestion invigorated. But if the new demand of his system were not met by an increased supply of food, he would soon become exhausted by the extra exertion and his health would fail. If obliged to persist in the labor he would simply use up the substance of his muscles and grow thin and lose weight, until, finally, he would die. Exactly in the same manner as in this homely illustration all special fertilizers act; guano, lime, plaster, potash or wood ashes, salt or equivalent substances all finally produce this exhaustion if the soil is not reimbursed for its extra production. "Out of nothing, nothing comes;" and if 100 pounds of plaster produce half a ton of clover extra, the soil has been made to yield up potash, soda, phosphoric acid, magnesia, chlorine, with carbon and nitrogen, in addition to probably lime and sulphuric acid, in excess of that derived in the plaster. The vigor of the plant derived from the stimulus applied has enabled it to draw this excess; and this excess must be returned. It is seen, therefore, that the use of plaster is only a temporary expedient, and if it is to be applied every year to the same land there will be needed some other fertilizer added to it. The legitimate use of plaster is in increasing the clover crop or other crops which should be fed upon the farm and returned to the soil, or which should, in large measure, be ploughed into the soil. If a crop of clover is plastered and turned under as a fertilizer a permanent benefit accrues, because a large addition of carbon and nitrogen which are derived in some way or other from the atmosphere is made to the soil, and, besides, the decomposition of the clover dissolves or sets free from the soil some of its mineral constituents, and in this way a green manuring adds actually more to the soil than it itself contains. In this way the ultimate and greatest value of plaster is made available.—N. Y. Times.

Deep Ploughing.

We are fast approaching a unanimity of opinion that the old system of scratch ploughing—inverting the soil to a depth of three or four inches—runs the land and the land-owner. "Daddy done it," it is true, but Daddy did very wrong. He could afford it, however, better than we can. It was criminally wasteful of the gifts of a bounteous Providence, but

when he had utterly exhausted the surface of a piece of land, he could afford to move away to a new ground and repeat the process. Hence the bald red hills, seamed with gullies, and hardly capable of sustaining the stunted pine saplings with which they are sparsely covered. Daddy's children and successors cannot indulge in this extravagance. We must stay where we are. We have no new grounds to skin. The red hills are our sole inheritance, and unless we can reclaim them—bring them back by kind treatment to the state of fertility in which our ancestors found them—we must continue to be as poor as we are now. It is demonstrated that we can do this. Daddy has only exhausted a few inches of the surface of our land. He has left a deeper soil than that he wore out, which we can make productive if we will only open it and let in the light and heat. This is done by ploughing. But those who believe in deep ploughing often make the mistake that deep ploughing means inverting the soil to a depth of eight or ten inches by a great turn-plough, carrying the surface mold down to that depth, burying it out of reach of plants, and bringing up in its place the hitherto unused subsoil which has not yet been made productive by the fertilizing influences of the air. The growing season is not long enough to fertilize this newly exposed soil, or allow the crop to reach that which has been turned under, and the result is that the convert to deep ploughing believes that he has "killed" his land and has made a fatal blunder by following the advice of those "blamed book farmers." If he would have the patience to wait until the newly turned soil, by exposure to light, heat and air, had become fertile and mixed with the inverted subsoil, he would find the entire soil fertile to the depth he had originally ploughed, and that he was fully protected against all danger from drought. But the use of the subsoil plough obtains immediately all the advantages of this deep turn ploughing, and that with less expenditure of power. Plough the surface soil to a depth of six inches, and following with a subsoiler break the subsoil to an equal depth, and all the good to be derived from deep turn ploughing after years of patience is had at once. Whatever manure is applied is thus turned under sufficiently to prevent the loss of its fluids and escape of its ammonia; while surrounded by loose, moist, aerated earth, it is acted on by heat, air and moisture to insure speedy decomposition and make it immediately available for the nutriment of crops. Were manure and subsoiling both unobtainable in combination, and were the farmer obliged to dispense with one or the other, we should unhesitatingly take the subsoiler and let the manure go.

We must, however, carefully remember that deep ploughing is not necessarily deep turning, but deep breaking. If we remember this, we will never complain of land being killed, nor denounce the book farmer.—*Can. Philop. Southern Farmer.*

Permanent Pasture v. Arable Lands.

A correspondent of the *North British Agriculturist*, sends the following sensible remarks in a communication to that journal:—"The high price of butcher meat, and the great cost of labor, have led to a great deal being said and written lately about the conversion of arable lands into permanent pasture. Now, I have great doubts about this system of turning arable lands into pasture continuing to be profitable to the farmer, even supposing butcher meat kept at its present high price. If the system is to continue, it is my opinion we will have to go back to the olden times, when all the meat for winter use was killed and salted in the autumn. For by increasing our acreage of pasture, our acreage under white and green crop must be reduced to the same extent. We may be able to keep a greater number of stock on our pastures through the summer, but in winter (and it is in the cold winter months the largest amount of butcher meat is consumed) we find we cannot feed as many cattle under the new system as we could under the old, when we had less pasture and more turnips and straw.

Any one who has noted the prices of stock in our markets for the last two or three years will have observed that this unnatural state of things is already beginning to be felt. In fact, the cattle trade has lost its balance. With a large acreage of pasture in the country, there is a great demand for grazing stock in the spring, and a consequent rise of prices. Then in autumn, when the grass fails, and there is a large stock to winter on a reduced quantity of food, the prices naturally fall. Under this increase of pasture we may have succeeded in raising a larger stock, but taking into consideration the enormous number of half-fat animals that are slaughtered sometimes in

autumn, I don't think we have succeeded in manufacturing more beef or mutton.

The plan I would suggest to improve this state of matters would be to keep a greater number of cattle in counts through the summer and feed them on cut grass. No doubt this plan will meet with great objection in consequence of the amount of extra labor it entails, but taking into consideration the greater number of cattle a given acreage of grass will feed when it is cut in comparison to the same acreage under pasture, and also the amount of land it will set free for the growth of corn and turnips, I am certain farmers would find themselves better repaid by being able to produce more meat at the proper season than by letting their land lie in a half-idle state of permanent pasture.

Smut in Grain.

Corn smut is caused by a parasitic fungus long known to botanists by the name of *Ustilago Maidis*, and it has frequently been described and figured in botanical works. Its development or growth is also pretty well understood. The fungus grows from very minute spores, which are produced by millions, but exactly as to how these spores react and infect the growing corn, I can find nowhere any definite information, nor have I seen any data relative to preventives. We are left here to surmise and analogies. Smut in wheat is produced by a similar fungus, similar in its botanical characters, in its results, and this wheat-smut fungus is much better known. It is proved that this gains access to the plant through the seed. The spores are sticky and adhere to the sound grain at harvest or thrashing, and are sown with the seed wheat. As the new wheat-plant grows, the fungus develops in due time with it, opening its spores at harvest. The spores may be killed and the crop saved by soaking the seed wheat in strong brine, or in a weak solution of sulphate of copper, commonly known as blue vitriol or blue stone. (The proportions used are two to five ounces of the crystals per bushel of wheat.) It would be well to try the same remedies with corn. I have seen this recommended, but I have no information whatever as to the results. Corn-smut is rarely abundant enough to seriously affect the crop, and is principally dreaded because it is poisonous to cattle.—*Prof. Brewer.*

How Sod Manures.

Geo. Geddes says in the *N. Y. Tribune*. Prof. Kedzie, one of the most careful experimenters among scientific men, Prof. of Chemistry at the Michigan Agricultural College, "took a square foot of which there are 43,560 in an acre) of June grass turf, and washed away all the soil in running water; and then weighed the grass roots and surface grass, or the amount of green manural matter usually contained in a heavy greensward, and found it to be five pounds to the square foot, or at the rate of more than one hundred tons to the acre." The Professor, in his letter to me, from which the foregoing has been extracted, further remarks that "this is doubtless in excess of ordinary greensward, as it was a very heavy mat of June grass"—but he says he "thinks that few farmers estimate correctly the amount of vegetable matter they add to their soil by ploughing under heavy greensward." One hundred tons to the acre of clean grass and roots from the turf of an old pasture or lawn, is a very valuable manuring, when we consider how evenly it is spread and accurately it is applied. But the roots of June grass run but a little way into the ground compared with the roots of red clover, that penetrate from two to four feet, and bring to the surface the fertility that lies deep in the soil. When a clover sod, that after being mown, has been allowed to stand a few weeks, and the new stalks are grown to be perhaps eight or ten inches high, there will be about all that can be ploughed into a furrow.

DRIED POTATOES.—The *Rochester (N. Y.) Express* says: "Lately a trade has been developed among some Rochester shippers about which but little is known. It is the trade in dried potatoes. Potatoes are sliced up and dried in much the same manner as dried apples. One firm in this city has an order on hand now for 50,000 pounds of these dried potatoes, as well as for 1,500 bushels of onions, which are dried in much the same manner. They are intended for the navy. A bushel of potatoes dries away to about ten pounds, and a bushel of onions to about six pounds. When ready, they are put into large tin cans, holding about forty pounds each, and sealed up the same as oysters."

Grasses and Forage Plants.

Hay-Making.

That an immense quantity of hay is spoiled annually by many farmers plodding on in the ancestral ruts and clinging to the old hazy tradition of the custom of the district in which they live, heedless of the appearances and circumstances which guide their more enlightened brethren as to the proper time for mowing this important crop, is abundantly evident to every well-informed agriculturist.

Because Mr. Jones, whose land is well sheltered, loamy, friable, and dry, has begun hay-making, Mr. Brown must follow suit, although his land is cold and exposed, clayey, mossy, and wet, and notwithstanding too that he has applied different dressings and manures to the soil. It is surely worse than absurd thus to do out of season what others do in season simply to be up in the race, and to make hay on dry soils and wet, clayey soils and mossy, sandy soils and loamy, at the same time, regardless of the condition of the grass plants.

The right time to mow grass greatly depends, of course, on the system of farming pursued, on the character of the pasture which produces it, and on the nature of the soil and climate, but especially on the condition of the plants as regards maturity. Hay is just as much injured by being allowed to get over-ripe as it is by being cut too soon. Moreover, the farmer ought to be guided in a great measure by the use to be made of the article—whether to feed horses, cows, young stock, or sheep. If for horses at work, the grass should be mowed after it has passed out of blossom, when the seed is in the milk, because at this stage it contains the largest quantity of nutritious substances, such as sugar, starch, gum, &c., which are of the highest value, contributing much towards rendering hay such a choice article of food. If for cows it should be cut earlier, so as to leave the grass as nearly in the green state as possible—soft and succulent—because in this condition it contains a larger quantity of juices which assimilate well in the animal, and produces a greater flow of milk. If for young stock and sheep, the grass should be mowed when in full flower, because after flowering, and as the seed forms and ripens, it is exposed to loss in its nutritive matter by the seeds being shaken out and the brittle foliage breaking off during cutting and making, and the grass itself, especially the rye grass, becoming almost a woolly fibre, losing nearly all its sap and sweet aroma. In short, hay made from over-matured grass is no better than ordinary straw, if indeed so good.

Clover, again, which is such excellent food for milch cows and sheep, should be mown immediately after blossoming, before the seed is formed. It should be cured by gently turning over the swathes in such a manner as to lose as little of the foliage as possible, and the tedding-machine ought never to be used under any circumstances. Moreover, clover ought not to be exposed long to the sun, but, being wilted and partially dried, should be put up into small cocks and left to cure for four or five days, when it will be fit to cart away. A very good method to prevent fust in a wet season is to carry the green clover and lay it in alternate layers with dry straw, sprinkling a little salt on each stratum. Fermentation will speedily set in, giving a sweet clovery flavor to the straw, such as cattle like very much and eat with avidity. Besides, straw is a good corrector of the heating qualities of clover ricks. The most profitable use of clover, however, I have found to be to cut it green for the farm stock, or to feed it off with sheep.—*Cor. London Times.*

Sowing or Drilling Corn for Fodder.

We wish to impress upon our readers, especially those who keep cattle, the great value, convenience and economy of sowing corn to be used for fodder. Last year we planted it in hills about 18 inches apart, and aimed to get 8 or 10 grains in a hill; rows three feet apart. The object of planting in hills was for convenience in cutting. It was the most profitable crop on the place. The corn was cut up before frost, and shocked in the ordinary way. The stocks being small, there was no difficulty in cutting all up in the straw-cutter, though we fed most of it in the ordinary way. One of our neighbors, however, who had a cutter driven by horse power, fed his cattle all winter on drilled corn chop, with a little bran and shorts, and we think his cattle were never wintered so well nor so cheaply.

A Mr. Simmons wrote to the *German town Telegraph* that, as late as June 3rd, he drilled 12 quarts of corn in rows 2 feet apart, on a third of an acre of land, and applied 1½ cords of manure and cultivated twice, a man following with a hand-hoe. The corn grew 10 feet high. Cut up just as tassels began to blossom, it made 300 bundles, averaging 20 lbs. green and 8 lbs. dry, being at the rate of 7,200 lbs. dry fodder per acre; which he judged to be worth more per ton than hay for feeding cows.

Another farmer, in Peekskill, N. Y., drilled two bushels of corn on 2½ acres of meadow land after he cut the hay, covered the drills with fresh cow manure, cultivated four times up to August 10th, and cut with sickle September 10th, laying corn cross-wise of rows to dry for five days, then tied it up and shocked on adjoining grass land. He then re-ploughed the corn ground, and seeded again to timothy. The stocks were tall and slender, and eaten clean without cutting. There were 8 tons of corn fodder.

These are instances that cannot be equalled by large farmers in the West, perhaps, as they will not be likely to apply their manure to such a purpose, but on rich land, without this it is probable that nearly as much per acre could be grown.

At all events we are satisfied that where hay is likely to be short, as we fear will be the case in many localities this year, there is no substitute that will answer the purpose so well as the drilled corn. Indeed, we are firmly convinced that in all cases this fodder can be used to some extent as a feed for cattle of all ages, with greater economy and profit than any other crop the farmer can produce.

Where the corn is not cut until September, and is planted as early as the middle of June, there will be a good many small ears of corn; and this has been the condition in which we have fed it.

As to the result of cutting when in blossom, as in one of the instances above cited, we have no experience; but have no doubt the fodder, when cut at that stage, would be exceedingly nutritious, and very readily eaten, not only by cattle but by horses and sheep.

The only objection to the practice is, that it involves more labor in harvesting, as a good deal of care is required in curing the fodder before it is shocked, and it should, we suppose, be tied up in bundles; all which a small farmer would regard as objectionable, while the larger landholder of the West would think it impracticable. Another advantage of cutting in the green state is, that we may plant as late as July, and obtain a good crop if the weather be favorable. But we would not advise this late planting. Dry weather, which we frequently have at that season of the year, would on ordinary soil seriously affect the crop; while, if we plant the latter part of May or before middle of June, we may be assured of a full and satisfactory return for our labor, equal, we repeat, to any crop we can grow.—*T. C. J. in Chicago Live Stock Journal.*

Yucca or Bear Grass and its Uses.

If there is anything we like, it is to meet a man with a horticultural hobby. We ought to be doubly gratified in the case of Col. Jas. T. Worthington, of Chillicothe, O., who has two hobbies which he has ridden very successfully for some years. One of these is to show that figs can be grown in Ohio in the open ground, and the other is to utilize the Yucca or Bear Grass. We some years ago called attention to Col. W.'s estimate of the value of this material, and now having another letter from him, we renew the subject. The common *Yucca filamentosa*, the Bear Grass or Adam's Needle, is a very common plant in our gardens, where it is cultivated for its subtropical foliage and its enormous clusters of white hily-like flowers. The kind grown by Col. Worthington has been by some botanists considered as a distinct species and called *Yucca staccida*, but our best botanists regard it as a form of *Y. filamentosa*, with longer, more abundant, and less rigid leaves. The leaves of this, when properly cultivated, are three to four feet long and one to two inches wide; the plants grow so vigorously that in three or four years they form stools covering a space about four feet square, and furnishing a great abundance of leaves. The flowers are very similar to the form so common in our gardens. In regard to the uses of this plant, Col. W. writes: "For supplying cheap, strong strings and bands, it has no equal; is excellent for tying up bacon, hams, corn shocks, vines, bundles of vegetables, mending baskets and other purposes when string or band is needed, and requires only to be known to be generally cultivated. The leaves of this plant will, I think, be eventually used for cordage, matting and coarse cloths, instead of jute and other fibrous materials which we now import."—*American Agriculturist.*

A Pleasant Chat about Hay.

A contributor to the *Hartford Courant* says: "In expending our little bay of hay—a twelve-foot cube, or thereabouts—I find each horse-load reminds me by its peculiar herbage of the part of the meadow it came from, and the circumstances of its gathering in the regular inverted sequence of the hay harvest. The loads that were perfectly cured gave an account of themselves in a more aromatic sweetness. Those that were stored with a risky excess of moisture tell the tale in volumes of fine musty dust, especially in the middle of the mow. The heat there was undoubtedly near the scalding point, the hay shows a dull, brownish green tint, and has become very dry and brittle. The sugary gums and dried juices belonging to hay in its best condition, and tending to preserve the weight and strength of its fibre, seems to have been quite consumed in the interior parts of some of the loads. So that the young ones in one stormy day, with a jumping frolic, may reduce a whole fuddering to the lightest chaff. The outside is in better condition, showing that, if I had taken the precaution to provide one or several small air-holes from the bottom upward, as by pulling up small pieces of joist while the hay was being filled in, this waste of the richer and more appetizing portions of the fodder might have been prevented.

A partial remedy in the use of such hay is to sprinkle each fuddering with water several hours before it is wanted—a pail of water, say, for ten or twelve animals. If the hay is fine, whatever provender is fed may be mingled with the hay, layer by layer—adding more water from the nose of the water-pot. Thus without a slop upon a clean barn floor, or making the mixture heavier than wilted grass. The water alone will settle the dust, and develop anew whatever of fragrance the hay may be capable of yielding. The improvement is as obvious as that produced in stale bread by steaming, or heating in the oven with a moist cloth. It is a similar dampening by the weather that makes rough and musty fodder, thrown from the stack, more acceptable to cattle sometimes than the best dry hay would be."

Sowed Corn.

Having grown this for the last ten years, I wish to urge it upon my brother farmers, especially dairymen, if there are any not already in the habit of sowing it.

My crops of it usually embrace four acres every season, and there are no four acres on the farm which I could not easier spare. The nearest estimate I can make of it, is an average crop of 20 tons green fodder per acre. I drill it at the rate of two bushels per acre, making three sowings, the first about the 10th of May, and in drills 2½ feet apart. On the ground intended for sowed corn, I haul manure during the winter from the sheds and cow stables, giving it a pretty heavy coat. The cultivator is kept going between the rows, so as to make it a cleansing crop, and as it only makes small ears and by no means matures a crop of grain, I do not consider it an exhausting crop by any means.

I have 30 cows, who from the first cutting to the very last, thrive on it and increase in their milk and butter. During the last of July and all of August and September, this sown corn is nearly my main dependence. The large yellow corn turns off for me more weight to the acre than the small varieties. Some small ears mature before the hard frosts and these are highly relished by the cows and help to put them in condition for their winter quarters. I have no scales on my place, and therefore can only estimate the weight of *dry fodder* per acre which I put at 5½ tons. This is fully equal to the best hay. I cure it by laying on the ground for two or three days after cutting, or when convenient stand it up against a fence. When sufficiently dry it is tied in small sheaves and these are put in large stooks, convenient to the barn, and on suitable dry and clear days are singly hauled on to the barn floor or into one of the mows, cut up by a cutter, and moistened with hot water before feeding to the cows, when meal and bran are mixed through it, and there is no refuse left worth speaking of.—*Cor. Practical Farmer.*

UNCLE SAM has under cultivation, at Mare Island, 270 acres of wheat, 30 acres of barley, 65 acres of alfalfa, and 47 acres wild oats.

THE Sussex county granges talk of buying clover and timothy seed this spring through a Missouri grange at a saving. In which case, the Missouri grange occupies the position of "Middleman." Does it not?

Rural Architecture.

Design for an Exhibition Building.

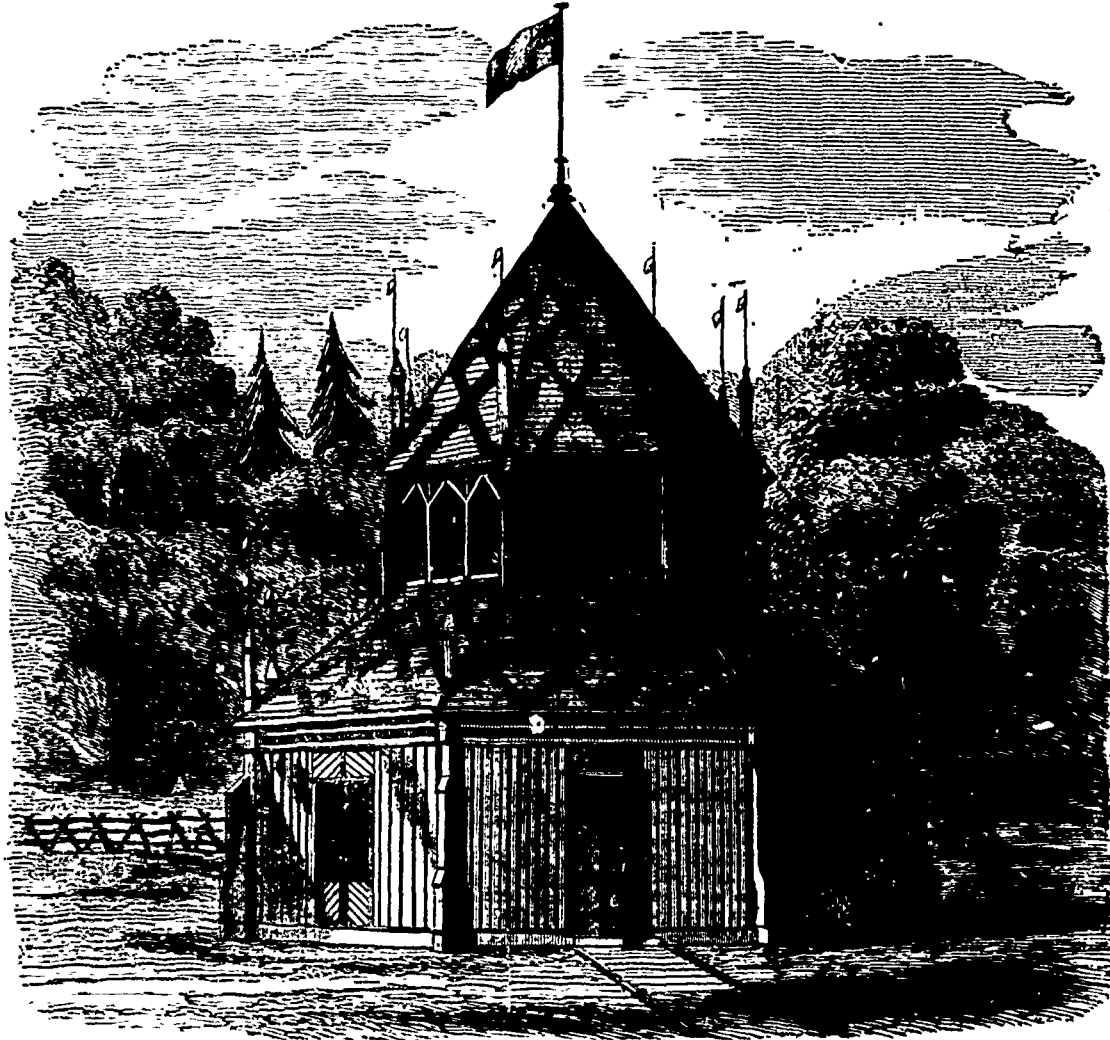
We herewith present our readers with a plan and perspective view of a building suitable for the exhibition of agricultural produce. It is drawn about 70 feet across between the outside framing, and of this size it could be built for about \$4,000. It has the advantage, moreover, of being capable of either reduction or augmentation in size without spoiling the design. It could thus be made suitable for either a county or a township agricultural society. Supposing it was erected, it could be easily enlarged without injuring its appearance by the addition of sheds leading up to each doorway. It is proposed to

space of $\frac{1}{2}$ of an inch between—the top edges to be chamfered off to prevent splinters; the space between will be for the dust to fall through. The outer framing should have posts 6x6, and studs 6x3, with horizontal ties 6x2, not more than 3 feet apart; on these lay inch-dressed vertical boards, and cover the joints with a moulded fillet 3x1 inches. The inner posts to be 12 inches in diameter, with turned caps. The heads to be tied to each other and to outer framing by iron tie-rods; these rods will serve for the suspension of specimens of ladies' work at exhibition time. On head of posts lay a curb 10x6, on the top of which lay a ring of flat iron 2x $\frac{1}{2}$ inches, either in lengths well bolted together, or in one piece welded together. A similar tie to be let into the upper plate immediately under the roof. At each angle fix a curved hip rafter or rib, deep enough to take a

asserted that a plan of this shape is the most economical which can be adopted for the purpose, covering a greater area with less hold for high winds than any other shape except the circular; and the circular, involving as it does about double price for all fittings, cannot compete with the plan we have adopted. Of course, the foregoing specification does not pretend to describe every particulars of construction, but only to give an outline, to show the practical man what the main features are intended to be.

Barn Cellars.

I would advise any man that builds a farm to have a cellar by all means. There is more damage done to fodder in a badly constructed, poorly ventilated tie-up in twenty-four hours than comes from a well-



EXHIBITION BUILDING.

be erected of frame work or cedar posts, but it would look well if built in iron and glass, although, of course, in that case the expense would be very much greater. The following is an outline specification of what would be necessary to erect it in frame work.

Set down cedar posts 6 feet long and not more than 6 feet apart under the outside framing, and bed the same on rough flag-stones not less than 2 feet in width each way. Place a similar post under each shaft of inner framing. Fix sills on the top of posts 6x8, all to be halved together, and have iron straps at angles, a cross-side to go from each angle to one of the inner shafts. Across sills lay joists 12x2. The space under the central show-board need not be floored, but the joists can finish on a sill on cedar posts as before described. For a floor, lay stuff 3x2, with a

partin 6x6 in the middle; on this lay common rafters 8x2, cover them on the inside with dressed sheeting, with grooved and tongued joints. The ribs of upper roof to finish into a large pendant, which will be continued through the roof and be bored out to receive the flag-staff. The whole of the inside to be lined with dressed sheeting and be twice stained and twice varnished; the boards being alternately stained light and dark. Round the eaves, inside and outside, place moulded cornices, those inside to be picked out in two colors as directed: the iron work to be painted blue, with gilt crosses, the eaves to be treated in a similar manner; the outside to be painted in two colors. The framing may appear too slight for a building of this size, but the form of the building makes it very strong, and it may be safely

arranged cellar in as many years. I have had some experience in building barns and handling hay and grain, which may possibly help some one. If a large barn is wanted, have the barn 60 feet wide, so as to tie-up four rows of cattle. Have the cellar wall nine feet high, the sides five feet high, and there will be a good chance to light the cellar. Support the frame with rows of stone posts; have the tie-up eight feet high, leaving six feet on each side and eight feet through the centre for feed floors. Have the plank where the cattle stand four feet to four feet ten inches deep, according to the size of the cattle to be stabled. Have a drop eight inches deep and eighteen inches wide for manure, and to put in manok, &c. Have the barn high enough to hold all the fodder required for our long winters. Let the door to drive

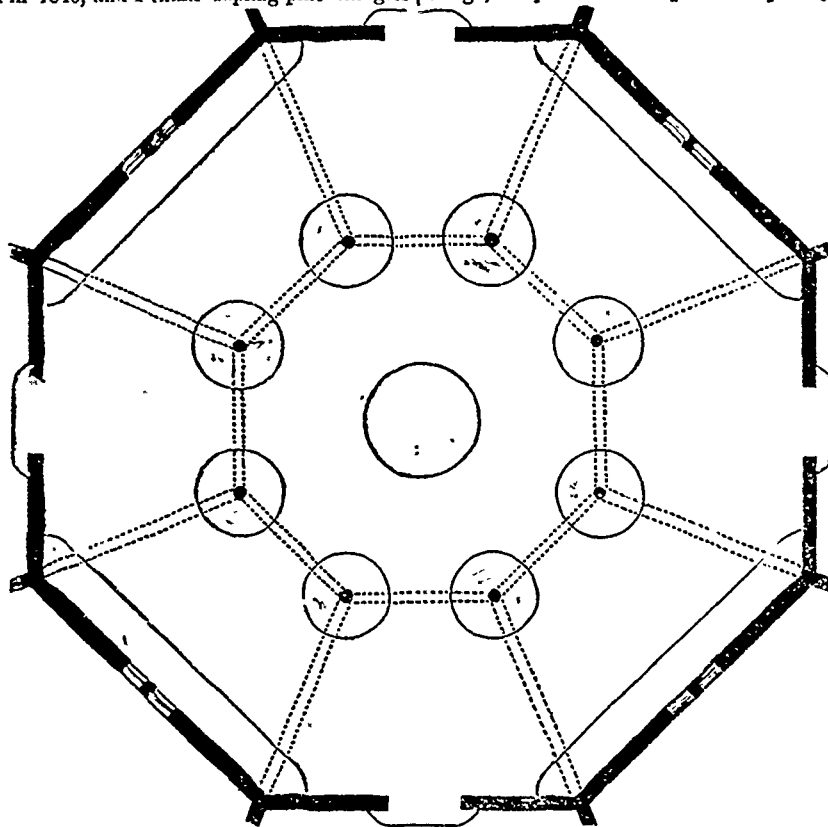
in be as high up as the ground will admit—above the high beams if possible.

If a small barn is required build it side to the hill, wall one side and both ends of the cellar, and have the tie-ups crosswise the barn. Put a cross roof on one side, so as to drive in as high up as possible, and you will find you have a barn with more accommodations than two common barns, with more room for stock, better accommodation for hay and grain, which may be much easier stored, and with less expense than a different sized one. Double boarding is much the best outside finish, and by far the cheapest. Half inch lining boards sawed out of fir or any small timber will answer; nail with twenty penny nails.—*Cor. Maine Farmer.*

Oiling Roofs.

A correspondent of the *Mirror and Farmer* says—“In 1848 I built a shed from the house to the barn with two roofs; shingled it with sapling pine shingles. One roof or one side I oiled with bank oil, which is the cheapest fish oil in the market—then worth about forty cents per gallon, worth about sixty cents now—and it proved an experiment worth being made known to others. The roof or side not oiled had to be shingled over eight or ten years ago. The side which I oiled is yet good. I oiled it over again last fall and how much longer it will last I don't know, but I do know it has lasted twenty-five years without repairing and without leaking.

“Last fall I oiled other roofs beside the one which was oiled in 1848, and I think sapling pine shingles



GROUND PLAN OF EXHIBITION BUILDING.

well oiled when first laid, if they are dry, and well oiled once in ten years, would last an age. The shingles should be perfectly dry when oiled, and as much oil put on as will strike in.”

Concrete or Gravel Wall.

Our plan is to make the compound into brick, by taking water-lime, three barrels to the 1,000 bricks; size of brick three by four. Slowly cure them in the usual way, with water and fair weather. When well cured and laid in a wall with mortar, the wall will last as long as wood grows and water runs.

That body of mortar will not cure in a wall so thick. The brick when well capped and laid in a wall of any thickness, will stand all weather.

We are in the business of making well brick, and also of making straight brick. We are going to lay a wall of the straight brick soon. These bricks cannot be made with safety only from the middle of May to the beginning of September. Light frost injures them. Very hot weather will spoil them, unless wetted three or four times a day. That will make the best wall that can be made of lime and gravel. If any one has a better way we want to hear from them.—*W. Rural.*

Implements of Husbandry.

Importance of Simplicity in the Construction of Implements.

There is no class of machinery subject to so many trying varieties of circumstances as farming implements, that is, which meet with so many irregularities of resistance.

A locomotive is made up of many parts, and is essentially a complex system of machinery, but having a smooth surface to traverse, this machinery works uniformly and steadily, and is consequently uninjured, but if, in its progress, it met with formidable obstructions and uneven resistances, it would soon be broken to pieces. Now an implement for use in or on the soil is constantly meeting with the most varied irregularities, such as hills and hollows, hard and soft soil, roots and stones, all mixed up together, so that complexity in their construction would be the surest requisite for their speedy collapse. A complex machine that meets, while in motion, with an occasional severe obstruction, receives upon each occasion what is equivalent to a heavy blow from a sledge; and when this is repeated frequently, the pro-

bolted together, thus becoming as it were one. For this reason, with its moderate weight, it moves through the soil with little difficulty, turning aside from obstructions on account of its wedge-like form when it cannot remove them. The harrow also, although composed of many pieces, becomes a fixed solid frame, and moves onwards through the soil in, to all intents and purposes, one solid piece; so also with the more simple cultivators, scarifiers, &c., &c. But let us contrast either or all of these for a moment with the more complex machine, for example Pratt's ditcher, considerably used a few years ago, but ending in complete failure. The construction was ingenious no doubt, and the machine was well and strongly built, and so long as it remained new, with every part uninjured and in good working order, it worked admirably in some kinds of soil. But it was made up of a multitude of parts and it weighed about ten hundredweight, and these two facts fixed its doom as an implement for general use. It is one of the fundamental principles of mechanics that the body delivering a blow receives one just exactly equal to the one given. A complex machine therefore, weighing half a ton, and moving along at the rate of from three to five feet per second, cannot possibly encounter a formidable obstacle without sustaining a correspondingly formidable jar, and a continuation of such jars result simply in the ruin of the machine. Such has been the history of the ditcher mentioned. Continuous jars bent or broke its parts; the bent or broken parts retarded or stopped the machine; time was lost, and money with it; so the machine had ultimately to be laid aside. This machine is not at all the one now so popular and so much used in different parts of the country. We have only taken it as a simple example of over-complex heavy machines for use in the soil. Mowing and reaping machines, though not subjected to the same kind or quantity of resistance, are open to a similar charge just in proportion to the complexity of their build and construction. Farmers know only too well how it is with the best, strongest, and simplest kind of them when they are driven against obstructions by careless teamsters.

There is another formidable objection to complex machinery, and that is, its cost. The more complex the more costly. Even with some of proved value the expense is a serious item with moderate farmers, and becomes more serious when an investment is made in one of those absurdly complex arrangements with which some of our neighbors across the lines are flooding the country. Mowers and reapers cost in the neighborhood of \$150; grain drills, \$80 to \$90; threshing machines, from \$100 to \$400; horse rakes, from \$30 to \$50; hay tedders, from \$80 to \$100; iron rollers, \$50 to \$100 and so on. Placing all these sums together the cost is quite an outlay—more economical by far, it is true, than by doing without them; but greater simplicity, with consequent cheapness and durability, would facilitate progress in agricultural improvement. A single machine, known on the other side as Comstock's Spader, is offered at \$25, twenty times the price of the best cast-iron plough, and ten times that of the best finished steel plough, and yet it is applicable only to land free from stones.

The object of these remarks is to caution farmers against investing money in newly-invented contrivances of high promise at first, but which are liable to the objections pointed out; and also inventors and manufacturers themselves against engaging in enterprises having seemingly golden promises at hand, but fraught with failure in the distance.

How to Build a House.—A writer in the *Country Gentleman* writes: “We will suppose a frame enclosed with clap-boards or siding ready for the mason. Have strips of an inch, or inch and a quarter wide, sawed from any common boards and nailed in the centre, up and down of the studding, upon which nail a course of lathing. Let your mason apply what they call a scratch coat of strong coarse hair mortar from ceiling to the floor, without a skip. When this is done let him commence the lathing upon the face of the studs in the usual way for the regular side walls.

bability is that some part will be bent, twisted, knocked out of place, or broken. The lighter the machine the more favorable are its chances, but if heavy, its momentum proves such that it is scarcely possible for it to escape injury. The more complex it is also the more decidedly are its chances adverse, for the displacement, breakage, or bending of one part, however small, usually retards the whole and stops its working, keeping men and teams standing idle until the injury is repaired.

From these facts, established by long practical experience, men are gradually falling back upon the simplest possible kinds of machinery. The common crow-bar, for instance, has nothing complex at all about it; and whilst it is one of the oldest implements on record, it is likely to hold its place to the end of the chapter. For simplicity, of course, it cannot be exceeded. Spades, hoes, forks, &c., are all of a similar character. The plough also, although made up of several different parts, yet assumes the character of a simple machine when these parts are fitted and

Machine vs. Hand-Made Wheels.

A correspondent of the *Carriage Journal* thus writes about wheels. His remarks are valuable to all who own a carriage or a waggon:—

"The question is often asked, which are the best, machine or hand-made wheels? and some persons have published statements as to the durability of those made by hand, claiming for them superior merit over those made by machinery. Now, I am strongly tempted to believe that those who have thus placed themselves on record, have done it through ignorance of the subject they were treating of, or through their own egotism. Machine-made wheels, that is, those made solely by machinery, are a myth, although machinery is used to a considerable extent in their production. The hubs are turned, bored, and mortised by machinery; spokes are turned and rough-toned; fellos are dressed and bored. I do not believe that any of the advocates of the so-called hand-made wheels would be willing to return to the old custom of boring or mortising their hubs, hewing out and rounding the spokes, or, for choice, tenon the ends of the spokes with a hollow auger, or bore the fellos by hand. The only argument that can be made against machine mortised hubs, is that the mortises are not entirely true at the time when they are placed in the hands of the wheeler. This is, however, no fault of the machine, but is the direct result of the shrinkage of the hub, which, not being fully seasoned at the time of mortising, shrinks irregularly, and as a result the mortises are made to assume a position different from what they had when first mortised. The same would occur to hand-mortised hubs under like circumstances. The true policy would be to mortise just before using, but as this cannot be done where manufacturers purchase hubs of the turners, the next best course to pursue is to true up the mortises when about driving the spokes. The tenons are always fitted to the mortises, whether hand or machine mortised, so that there can be no difference in this respect, and as the number of spokes driven by machinery is too small to merit notice, the process of driving is the same, with the exception of the fact that the chances of the mortises being true are two to one in favor of the machine-mortised hub when the spokes are driven immediately after the mortising. I have driven a set of spokes into machine-mortised hubs when scarcely one out of ten of the spokes, before setting the shoulder, varied one-eighth of an inch from the true gauge, showing conclusively that the tenons and mortises were true. In contrast to this, I have seen advocates of hand-mortised hubs place one foot against the end of the hub, grasp the spoke with the left hand, draw the top of the spoke over an inch or two, and strike the 'home' blow, in order to bring the spoke out to its proper position, or place a lever before or behind the spoke and call upon a fellow-workman to 'send the spoke home.' Now I do not believe a spoke can be treated in this manner without injury to the tenon or mortise, and the wheel be weak and thereby. The true principle of wheel-making is to fit every part accurately, and to use the best timber. It is this that matters not whether the wheel be hand or machine made. I have noticed that in all cases where the advocate of so-called hand-made wheels cited instances of great durability, the wheels had been used on country roads only. Now the fair test is on city pavements, and I would like to see some of the superior wheels made in a country shop, when the hubs were bored and mortised by hand, and all other work, from the rough to the finished article, done in a like manner, placed upon city streets, for I am satisfied that a test of this kind would silence this class of croakers against progress in manufacturing."

Tubular Harrows.

A new kind of harrow has recently been introduced, and is much in vogue in California at the present time, viz: the tubular harrow. In every respect it resembles and is worked just like the common harrow, but with this difference—what represents our wooden or iron frame is there made entirely of iron tubes. It is claimed for the change that it is stronger than wood, lighter than the ordinary iron harrow, and withstands the ravages of climate better than either. Should the novelty prove what is claimed for it, we should not be at all surprised to see some of our enterprising Canadian manufacturers going into the making of it, for it is undeniable that owing to negligence or carelessness on the part of a majority of our farmers, our implements suffer as much from Canadian climate as from Canadian soil.

Horticulture.

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

THE ORCHARD.

The Codling Moth.

At a late meeting of the South Haven, Mich., Pomological Society, reported by Secretary Bidwell for the *Sentinel* of that place, a discussion took place on the codling moth.

Mr. Bailey said the miller was about half an inch long, of a gray ash color, with a brown and bronze colored spot on each wing, the male having short black hairs on the upper part of its back wings. The worm when full grown is about three-fourths of an inch in length, of a pinkish color, with a brown head. He found the miller flying about his house at dusk lately. They flew up and down in a zigzag motion and not sideways. Had frequently noticed that they flew towards the light and could easily be caught by clapping the hands together down and upwards. He thought they came from his apple barrels in his cellar, where they had hatched this winter. Had hatched many out in jars recently. Mr. Chatfield, his neighbor, had found them hatched under cloth bands in his orchard this spring. Mr. Bailey said that the silken cocoons could be still found under the rough bark of the apple tree and in the crevices near the base of the tree. He thought if we all united in destroying them they could be kept under control, and after we had done all we could, we might call in the birds to assist us.

Mr. Hurlbut said that when the apples were young the eggs were laid in the calyx; the eggs were about one-eighth of an inch in length and nearly white. When the apples were larger they would frequently be stung on the side. By stinging he meant where the worm entered the apple. The eggs must be laid all summer, as the worms could be found at all times under the bands in different stages of development.

Mr. Wigglesworth would recommend the use of tar barrels to catch the millers in.

Advantages of Studying Botany.

The most important advantage realized from knowledge of botany is the pleasure and happiness it gives. It makes us acquainted with the vegetation which surrounds us, the trees, the shrubs and herbaceous plants, and also the grasses which contribute so largely to the wealth and support of mankind in the temperate zone. Having an intimate acquaintance with these, our daily walks or rides in the country are made doubly pleasant and agreeable. The entire country belonging in a measure to the botanist, 'tis his to enjoy and admire; and he often derives more pleasure from it than its owners, because he does not have it to care for or pay taxes on it.

We have known invalids to become perfectly healthy by studying botany and collecting plants. Their walks and rides were pleasant and exciting, and their attention being always drawn to new and pleasing objects, their exercise was not fatiguing. They were looking for something new, and rarely failed to find it, and sometimes it was a rare and beautiful flower.

To the agriculturist and horticulturist a knowledge of botany will give more pleasure than any other science. It is with plants he deals, and the better he understands them the better he can manage them, and the more happiness he can derive from their cultivation. Such a person will be apt to make his home pleasant and its surroundings attractive with rare and beautiful flowers and fine fruits. Such a person has more of the elements of happiness at his command than a Stewart, Vanderbilt or Astor, with their millions; for these last have made the acquisition of money their chief end and aim. Their minds have not been enlarged by scientific studies, and they are strangers to the pleasures which studies afford. The many cares which they have, and which cannot be avoided in the management of such vast estates, render their lives toilsome and laborious, much more so than he who has a competency in the country, a good library in a pleasant home, and a scientific knowledge of his surroundings. He sees

"Wisdom in trees, books in the running brooks,
Sermons in stones, and good in everything."

—Ru. al. Adamson.

Uses of the Cherry Tree.

At the Michigan Pomological meeting, Mr. H. S. Clubb paid a tribute to the cherry tree, which, in every position, contributes in some way to the comfort and service of man. "Even the gum which exudes from its wounds is precious for medicinal purposes and makes an excellent mucilage;" its fruit is handsome; is undoubtedly the best that is canned or preserved; for drying, it has "no equal in the whole realm of commerce," its curative properties are universally conceded, and its rich color is the acknowledged standard of beauty on the lips of the most charming of women. Nor is this all. Its timber ranks high; "the household furniture next best to black walnut and mahogany is made of Michigan cherry, and thence transported to all parts of the world; the best printer's furniture is manufactured from Michigan cherry, and distributed from thence wherever civilization has carried the printing press. Cherry, grown wild in the woods of Michigan, is sought for by the manufacturers of school furniture, as the best wood they can find for their purpose. It is easily worked; receives a good polish; has a delightful lively color, and, in contrast with maple and walnut, gives a pleasing variety to decorative cabinet and carpentry work, which of late years have introduced a new charm to dwelling, office, store, railroad car, steamboat, and private carriage. The wood is hard without being coarse or knotty, and its grain, though not prominent, is fine and beautiful." Thankful ought we to be, and proud, that we live in a land and enjoy a climate where this fruit and timber can be grown.

Cutting and Packing Grafts.

Farmers who own small orchards very often wish to procure grafts of better sorts for trees which need re-grafting, but not infrequently forget all about securing them till the buds are too much swollen in spring for the successful performance of the work. It is better to cut and secure them now at once, if not already done, and to pack them away neatly and snugly, where they may remain till spring fully opens. They are sometimes thrown aside in a careless manner, and are either withered, or the names of the sorts are lost, or they become promiscuously mixed together. They are tied together neatly and compactly by means of bass or soft cord. The size of these bunches should not be very large, that they may be packed properly for retaining the moisture. Small strips of pine wood, nearly as long as the grafts, are then written with the name, and it is better to write on both sides, so that one name may show readily from the outside, and the other preserve it inside, in case the outer one becomes obliterated. The name will be most durable if written with a pencil on a thin coat of white paint, but they will commonly be sufficiently so if the wood is moistened just before writing with the pencil, and the name will be made darker and plainer if a nearly imperceptible fine grt of the soil is rubbed on when the stick is moistened. If the name is written on dry wood, it will disappear at the first accidental washing. In order to keep the grafts plump and in good condition, they may be packed in boxes in cool cellars, imbedded in damp moss or damp sawdust. Sawdust should not be in large masses, or it will heat, and the boxes holding it should not hold more than a bushel for this reason. Sand or pulverized earth, kept slightly moist, will answer well, but they render the bark more or less gritty, and liable to dull the grafting knife. Care should be observed to have the packing not so wet as to render the grafts water soaked; it is better to have them too dry than too wet, as they easily recover from slight shrivelling, but never from the black decay of water soaking. A temporary mark may be placed on single grafts or small packages by shaving a small surface and writing with a pencil.

—Country Gentleman.

The Perforating Power of Roots.

It is indeed wonderful how easily the roots of plants and trees bore through hard, impacted soils in search of nourishment. They use for this purpose a sort of awl, of immense power, situated at the end of the root, and capable, with the aid of the other root machinery, of thrusting aside heavy weights and getting through almost any obstructions. Yet the awl consists only of a mass of microscopic absorbent cells formed by protoplasm or vegetable mucus—the fluid in which vital action is first set up. The roots of the elm and the maple will bore through the hardest soil of walks or streets, enter drains, twine about water pipes, and penetrate through the seams of stone and brick structures. The roots of some plants have been known to pass through 18 inches of solid brick-work

and make their appearance in a wine-cellar below. Plants have a vast power in overcoming obstacles, when foraging for food. They are like a hungry animal which no fences can restrain when there is food beyond. The movements of roots in soils proceed on certain principles of utility in connection with the welfare of the plant. Some need much more moisture than others, and the roots will drive through rocks to obtain it; others need silicious food, and will penetrate through a clay bank to reach the desired foraging ground. The urgency with which nature drives plants and animals in pursuit of food is almost irresistible.—*Journal of Chemistry.*

The Plum Curculio.

This insect belongs to the same family as the Colorado Potato Beetle, but flies much more readily; has the same way of playing "possum" when you approach or disturb him, and consequently is easily caught by the thumb and finger on the tree or by jarring the tree, when he falls to the ground like a dead thing, but will soon crawl off or fly away if undisturbed. The curculio is of dull black or very dark brown color, from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch (?) in length. The early morning is the best time to hunt him as he does not like to fly only in hot still weather, but if they are any way plenty they should be looked after three times a day. I have seen them fly from the woods to my trees, mostly towards sundown of a still hot day, so that one is not safe from them even when none are propagated on his own grounds.

There is not a particle of benefit to be derived from any wash or application of any substance to the tree or ground on which the tree grows, as the Little Turk "careth for none of these things."

In addition to killing all found on the trees pick up every plum that falls to the ground, and see that it is eaten or destroyed so as to leave no eggs to hatch or larva to crawl out into the ground, or to hibernate under the bark of some tree to start the "breed" next year. If one has a large number of trees it will pay him to make a curculio catcher, but I will not take room here to describe one. It may be well to say here that the curculio stings cherries and peaches almost as readily as plums, and has been known to sting the apple.

He must be looked after as soon as the fruit sets, till the last of July, as in some seasons there are two crops of the beetle, but the greatest danger is when the fruit is about the size of a pea. The cherry does not fall like the plum, when stung, so that to eradicate the beetle in one season they must be picked off and destroyed effectually.

Some seasons are so cold that the eggs laid in the plum do not hatch, as they require about 70°; the eggs dying in about a week if not hatched; and if there is an entire failure of the plum crop one year, the "beetle" will be quite scarce the next, and a crop may be had; but one is never safe to trust to anything short of daily examination from the time the fruit sets till it is about grown.—*Cor. Western Farmer.*

HORTICULTURAL PROFANITY.—The *Norristown (Pa.) Herald* says that a man in Lower Marion wrote to the editor of a horticultural journal, and asked: "What are the most advantageous additions to dried grasses, for winter ornaments?" The editor replied: *Acroclonium roseum, A. alba, Gomphrena globosa, and G. globosa carnea.* When the Lower Marion man read this he fairly boiled with rage, and immediately sent a note to the editor ordering the paper to be discontinued. He said no editor who swore that way, just because he asked a simple question, should have his support.

FERTILIZING PLANTS ARTIFICIALLY.—It is announced from Vienna that a process, indicated by M. Houbrenk, for facilitating the fertilization of plants, has proved successful in the Botanical Gardens there. The process consists simply in touching the end of the pistil—that is, the stigma—in a flower with a pencil dipped in honey, or better, in honey having mixed with it some pollen of the plant operated upon. A Hibiscus Mexicanus, which had never yielded fruit, having undergone this treatment, produced quite a large quantity of good seeds. With several fruit trees the process also succeeded. Further, after operating on certain branches only of trees which did not yield fruit, it was found that fruit developed and was formed on these, while the branches left in the natural state gave none. The effect, if real, may be explained by supposing that the honey retains the pollen grains on the stigma, and thus favors the formation of a pollen tube, which is indispensable to the fertilization.

THE FRUIT GARDEN.

Cranberry Culture.

In reply to the inquiries of several correspondents relative to the culture of cranberries, we would say that but comparatively few farmers have suitable swamps or meadows for the profitable culture of this berry. What is most desirable, in truth we may say what is demanded for cranberries, is water, sand and muck. The plant is very peculiar in its habits, one of the most easily grown if in a congenial soil, and one of the most obstinate if not. Joseph J. White tells us that alluvial formations are the only ones in which the cranberry can be successfully cultivated; though this formation includes the most barren and the most fertile soils, yet its character is well marked and it can be easily distinguished. Sand or quartz rock, pulverized or granulated, is alluvium. The rich interval lands near the outlet of rivers are alluvium, and the mud found in narrow bays and creeks, and the muck or peat underlying swamps and fern lands are of the same character. Meadows formed partly by deposits of mud and partly of decayed vegetable matter belong to the same class, in fact, all alluvial formations caused by the action of water.

The cranberry cannot be successfully cultivated in drift formation, as hundreds of experiments have proven. Prof. Agassiz described the drift formation as being that portion of the earth's surface which is formed by glacial action, and consists of rocks not in place—that is, stones out of solid ledges, stoney land or gravel and clay. Boggy land well adapted to the production of this fruit, has been ruined by using drift material upon it with the mistaken idea of bettering the condition. From this our readers will be able to make proper selections of soils, and for the best methods of cultivation a good work on cranberry culture should be procured and studied closely, or, what would be better still, some individual visited and consulted who has a practical knowledge of the art.

Analysis shows that the cranberry contains little material drawn from the soil, the most of it being derived from the atmosphere and from water, and consequently this fruit will grow where but little else will. The American cranberry is divided by writers upon the subject into three varieties, the "bell," because the fruit is bell shaped; the "bugle," so-called from its resembling a bugle head, being elongated and approaching in shape to an oval; the "cherry," being spherical in form, and somewhat similar in shape, size and color to the cherry. Cranberries are found, however, existing in all the intermediate shapes between those mentioned above; for instance, the bell and cherry are distinctly marked, but there are specimens found bearing so much resemblance to both, that one could not tell to which particular variety they belonged.—*Ohio Farmer.*

Water Melons.

J. V. K. Wells, near Milford, Del., has the reputation of raising immense crops of melons of splendid size and superb quality. The editors of the *Peninsular News*, thinking it would prove acceptable to their readers, has taken the trouble to learn Mr. Wells's method of culture, and presents them as follows:

"His patch contained nearly five acres, and last winter it was an old sedge field, worn out land that had been uncultivated for several years, and abandoned to sedge and persimmon bushes. It was a sandy loam soil. He cut the bushes out of it and ploughed the sedge under about six inches deep early in April. With the rake-harrow it was then thoroughly pulverized and afterward laid out in squares six by eight feet. At the crossings of the rows he scooped out the earth with a hoe and put in a large shovelful of well rotted barnyard manure. This was covered with the hoe, and just before planting the seed a handful of Pacific Ocean guano was worked into the surface soil over each hill. The seeds were planted about the first of May, and when they were well up, strong and vigorous, he removed all but one plant in each hill. This was allowed to grow under a good cultivation with the hoe and harrow, until the vine began to set its fruit. Each vine was then prevented from setting but two melons by pinching off the blossoms, and the vines themselves were pruned by pinching in the terminal end. When these two melons had attained a size of six or eight inches in diameter, one or two more were allowed to set, and all other blossoms remorselessly removed until these last ones were well advanced toward maturity. After the first two were ready for market and the second

two had attained the diameter of six to eight inches, another one or two were allowed to set, and in this manner the vines were kept in bearing all the season, but at no time was any vine allowed to carry more than four melons, and in some instances but one or two. By this treatment the productive vitality of the vines was all directed to producing large sized melons. This is the only method by which the enormous melons of twenty to forty lbs. can be produced. If the vines are allowed to set all the fruit they will, the size cannot be great; but if each vine is allowed only to bear one or two melons, it will have vitality sufficient to carry them to an enormous size. The variety grown by Mr. Wells is the *Gipsies*."

Blackberries.

At a late meeting of the Indiana Agricultural Society, Mr. Ohmer said he had been very successful in growing blackberries. He had been in the business fifteen years, and lost but two crops in ten seasons. Three acres had averaged him \$10,000 per year. His rows were eight feet apart, and he sets his plants four feet apart in the rows. He planted posts four feet high, at intervals of thirty feet, and from nails on the top of the posts he stretched wires from post to post, to which his vines were trained. He ploughed once in the spring between the rows, and then put in the cultivator or harrow. He did not seek to make large canes, as these do not produce the best crops. He pruned back when the vines were three or four feet high. Allowed the old wood to remain among the vines from year to year, as a support to the young vines. The laterals he cut back two feet, or even less if the vine was delicate. Did not allow them to grow too thick, and no plants were allowed between the rows. The Kittatinny was his favorite, and if he were to plant ten acres he would plant all of that variety. He marked in half-bushel drawers. Raspberries pay better when sold in quart boxes. His soil was clay with a substratum of gravel. He did not manure at all.—*Mass. Ploughman.*

The Best Variety of Strawberry.

It is remarkable that a variety so old as the Albany Seedling, or "Wilson," as it is popularly known, should hold its own so many years, in spite of numerous new introductions. Gradually, however, it seems to be giving way to others. Last season the markets of Baltimore, Philadelphia and Washington, had large quantities of other kinds, and it was noted that these varying varieties were much more abundant than in former years. Among the leading kinds which, by this test, are growing in popularity, were Downer's Prolific, Boyden's 32 Green Prolific, Jucunda and Charles Downing. Triomphe de Gand, which for a long time seemed to contest the ground with the Wilson, was not so often seen. Still for all this the leading kind in all these three markets was the Wilson. It bears so abundantly, and grows so well generally, without being choicer about the character of the soil or situation, that in spite of some deficiencies, in other respects it will probably be in favor for some years yet.—*Ex.*

The Elder.

This is a very common shrub, and will grow in any soil without irrigation, and will not only make shade, but will also make a good and everlasting fence, if planted in the following manner, and if properly trimmed, quite ornamental. During the autumn season, when the first rains make the ground soft enough, dig a trench about two feet deep, and leave it open until the first or the middle of February; then cut your slips from three to four feet long, and of two years growth wood; make holes with a crowbar in the bottom of the trench about eighteen inches apart, stick down the slips, throw any rubbish in the bottom of your trench—straw will do; fill up the trench with earth and pack it closely, and in a short time you will have a good fence.

The berries of one variety is very much esteemed by many, in the shape of pies and wine, and what can be more gratifying to the senses than the delicious perfume of its flowers in their season.—*Rural Press.*

A Mr. Bogart, near Napanee, made during the recent season 500 lbs. of sugar from 400 trees. The Messrs. Tubbs, of West Lake, tapped 420 trees from which they made 1,700 lbs. of sugar and 50 gallons of molasses. The molasses would make something like 500 lbs. of sugar, making in all, from the 420 trees, during the recent season 2,200 lbs. of sugar.

THE VEGETABLE GARDEN:

Mushroom Spawn.

A correspondent of the *New York Sun* having requested information as to the best method of procuring spawn, received the following reply:

You can procure mushroom spawn of any of our wholesale seedsmen very cheap. You can also procure it artificially, but the surest way is to get a little of the spawn, if not more than half of a brick to begin with, after which it can be increased to any extent in the following manner: Collect equal quantities of horse and cow manure containing no litter, straw, or other foreign material. If you do not want a very large quantity, a good full wheelbarrow load of each will be sufficient. Put these materials under a shed, add an equal quantity—that is, one load of fine old leaf mold, and if you can get sheep droppings add the same quantity of this, but it is not essential to success. Now break all up fine and pass through a coarse sieve, adding water sufficient to make the whole mass about the consistency of thick mortar. Spread it out in a layer about five or six inches thick, and press it down firmly. As soon as it thickens or dries enough to hold together when handled, cut up into blocks the size of an ordinary brick, and in the centre of each insert a small piece of the spawn which you have previously procured, stopping the hole made by the same material of which the bricks are made. Put the bricks upon edge, and in such a manner that the air can pass readily among them. The bricks need to be turned occasionally and kept in a very dry place until wanted for use. There is no danger of keeping them too dry. The spawn inserted will spread rapidly through every portion of these bricks, and each will become thoroughly impregnated the same as the one originally purchased.

My Experience with Artichokes.

I planted about one-fourth acre with about one-half bushel of very small, dropped in furrows two feet and a half apart and about eleven inches apart in rows, gave them about the same attention as potatoes. Early in September I cut them before frost and used the stalks to roof my stable, thinking they were good for nothing else, but I found it very difficult to keep my horse from eating himself out doors. He would leave corn and hay for these stalks. I think I had about fifty bushels on the one quarter acre. But they were quite small, which made it tedious gathering them. I think they were too thick. I shall plant again this year. Top the stalks once or twice in the course of the season in order to make them "stubby," cut before frost, stack as corn, when cured stack and cut them in machine, mix with bran, steam or cook them if convenient.

I think they will furnish a large amount of valuable feed. I think the roots or tubers will grow all winter, when the ground is not frozen. Dig in the spring, or turn your hogs in to dig them for you. They are a choice feed for milk cows, and coming as they do early in the spring, when succulent food is scarce, hold the place of butter.—*Cor. Kansas Farmer.*

To Pickle Green Cucumbers.

Take small ones of a uniform size, wash, put in a porcelain kettle, cover with cold water, add a little salt; set it on the stove, let it heat gradually and boil five minutes; then drain off the water; add good vinegar; to one gallon of vinegar add one cup molasses, one tablespoonful cloves, do cinnamon; let boil five minutes; remove to an earthen or stone dish; pour over them the hot vinegar; cover tight, when cold they are ready for use. I never use any acids, nor cook in brass to make them look green, considering both injurious to the health.

When we prepare them for winter, I wash and scald my barrel to make it perfectly clean, cover the bottom with salt, wash the cucumbers in plenty of cold water, lay in a layer of cucumbers, sprinkle over with salt, and so continue, putting in alternate layers of cucumbers and salt each time of putting into the barrel; cover with cold water, laying on a flat stone to keep them under water, if any are allowed to come to the top of the brine, thereby being exposed to the air, they will rot. These will keep perfectly for one, two, or three years if desired.

When wanted for use, soak in cold water, changing every six hours, keep covered while freshening, as the light has a tendency to fade them, when the salt is all drawn out, prepare as green cucumbers, except to cook them longer.—*Cor. Rural New Yorker.*

Water Cress.

Many a one has a small stream in which the water cress might be successfully grown. It likes running water. Its slightly peppery taste is very agreeable to many people. In the early spring time it is one of the first things to come into use without the aid of hot beds or artificial heat. It is at this early season that it is not only most welcome, but actually best, for as the season advances it is rather too hot.

People who have no running water may have water cresses, but not quite so easily. They do well on any rich piece of ground if tolerably well watered. Just before they are to be used, say for a week or so, they will require shading in order to give them a delicate flavor; a hot bed frame is an excellent thing for the purpose. The plants can be kept moister under such circumstances, and besides, the shades being on, keep the atmosphere moister in the dry day time. Then when desirable to shade, the frame affords the best opportunity for doing it.

It is very easily raised. Young roots thrown into a stream of water will soon learn to take care of themselves and in garden culture the little pieces grow as easily as sweet potato plants.—*Ed.*

Keeping Celery.

For the past two winters I have been trying a new plan for keeping celery, in which I have succeeded quite well. I leave my celery standing in the ground where it is grown, and on the approach of very cold weather I bank up on each side of the rows with woollen waste, obtained from a woollen factory. The waste prevents the ground from freezing, and the celery comes out fine and crisp whenever wanted.

GARDENING NEAR CHICAGO.—A correspondent of the *West n Rural* says:—The gardening business is becoming yearly of greater and greater interest in and about Chicago. The German gardeners are paying as high as \$1,500 per acre for land for gardening purposes. For twelve miles or more out, the country about Chicago is being utilized for gardening purposes. This is more surely profitable than living land off into suburban towns. Experiments in steam gardening are continually being pushed, and seem to promise success. Spring "garden truck" is grown in this way in advance even of the season in the Gulf States. The proprietor of the first steam garden is so well pleased with his experimental results that he intends enclosing three acres for next winter.

A NEW SPECIES of Pumpkin is announced from the *Jardin d'Acclimatation* at Paris, under the Spanish name of "Zapallo de tronco," or "Tree-Pumpkin." It differs from all its congeners in its mode of growth, as, instead of trailing, it forms erect tufts, with numerous fruits of a depressed spherical shape, and from five to eight inches in diameter, depending from the stem. These are said to be of excellent quality and flavor. The chief merit of the plant, however, is that from its mode of growth, it occupies very little space in cultivation, while a single plant of any other species usually covers a large area. The seeds of the Tree-Pumpkin, here described, were obtained from Buenos Ayres.

GROWING RHUBARB.—Rhubarb makes a very handy, palatable dish, but very few, in my opinion, grow it to perfection. It is a great feeder, and requires considerable room to make it real nice. About eighteen years ago I picked up some roots that had been thrown away on account of their worthlessness; and, as I could get none other at that time, I resolved to try what good the best care would do for them. I had a trench dug about two feet wide by eighteen inches deep, and filled with rotten chip manure; when the roots were set in there was a little soil mixed in around them and over the crown, and then the whole bed, except over each crown, was covered with hen manure perhaps two inches deep. This was done in the spring; during the summer all the weeds were thrown around them; in two years the same household that had thrown these roots away, came to us for just one root of that mammoth pie-plant. We cut them sparingly the first summer, and gave them a dressing of hen manure every spring, being always careful not to let it come very near to the crown of the plant. In pulling I never take the stalk that is nearest the bud or youngest stalk, and always leave the leaves and trimmings on the bed, to be hoed in as soon as will. This bed received this treatment for twelve or fourteen years without being re-set, although the roots were sometimes cut in two. This theory may be nothing new to some of your readers, but the practice may be.—*Cor. Farm Journal.*

THE FLOWER GARDEN.

The Origin of Double Pelargoniums

BY THOMAS LAXTON, STAMFORD.

In 1866, I commenced crossing the *Triomphe de Gergoriat* or *Inquinans* race of double Pelargoniums with the ordinary single Zonal, but, after a three years' trial, I found it impossible to get out of the vigorous and "fat" growth of that class of doubles, all my seedlings, with one exception, showing no material variation from or advance on their parents, the exception being the result of a cross of *Triomphe de Gergoriat* with single Zonal *White Princess*, which had foliage approaching that of the pollen parent and small reddish flowers with whitish reverse of petals. This was the only seedling I succeeded in raising from many attempted crosses of any of the *Madame Vaucher* race with the *Inquinans* doubles, and it was infertile. I ought to state that I have only exceptionally used the single varieties as seed-bearers, on account of the greater security from self or foreign fertilization which, under ordinary treatment, the opposite method affords, and I have never been able to obtain seed from any of these doubles by fertilizing them with single Zonal *Beaute de Suresnes*; the converse I have not tried. In 1869, finding that so little was to be gained by crossing the *Gergoriat* or *Champfleur* type, I discarded it for *Madame Rose-Charmeux* and Mr. W. Paul's *Cottingham*, the two double *Tom Thumbs*, the origin of which I should much like to ascertain; doubtless, they are both sports from *Tom Thumb*, for I have found *Rose-Charmeux* to throw out a branch (probably a reversion) with single flowers only, and which I could not distinguish from *Tom Thumb*. I am afraid M. Jean Sisley's account does not touch on the origin of these, nor does he seem to have noticed in one of the English papers of the past two years a quotation from a Scotch publication of about 1826, from which it would appear that a double Zonal was in existence, in a Belgian nursery, nearly fifty years ago, and from the not over flattering description of the plant, I take it to have been a similar variety to *Marchal de Champflour*. From *Madame Rose-Charmeux* I obtained *Jewel* by fertilizing with *Lord Derby* and E. J. Lowe, by using the pollen of a seedling from Mrs. Pollock, and it is remarkable that the vigor of this variety exceeds that of either of its parents and that of the other seedlings produced by fertilization with the non-variegated single Zonals. Most of the seedlings from *Madame Rose-Charmeux*, having double flowers, were infertile, and from *Jewel* I could only get a single seedling, which I have since lost. Rather more than half the produce of over 1,000 seedlings from *Madame Rose-Charmeux*, raised in four years, came double or semi-double, the foliage and habit taking a more or less intermediate form, and none having the characteristic zone of the male parent entirely absent in the foliage. I have never been able to get nearer a white-flowered double than a light pink, and this appeared to be an exceptional sport, no white or pink variety having been used in the cross. A corresponding circumstance has occurred in crossing the single dwarf scarlet Zonal *Harry Hieover* with another scarlet Zonal, one seedling from it having flowers nearly white, or parti-colored, not unlike the continental variety *Cora*, but I never could get anything like a white flower by crossing *Madame Rose-Charmeux* with the *Madame Vaucher* type, and I have always found the white in flowers much less than other colors; and, in both the cases alluded to, the parents had each scarlet flowers, the light colors being probably due to reversion. It will, therefore, deeply interest me to know the origin of the parents of M. Jean Sisley's break in *Aline Sisley*, which has quite the *Madame Vaucher* habit and character, and no traces of *Inquinans* blood appearing in it. I have now several hundred seedlings from crosses of the double *Tom Thumb* race with the single Zonals and *Nosegays*, many showing remarkable variations in color and improvement in form. I have others, also, crosses between these and a shrubby single-flowered dwarf Zonal, having *Farsley*-like foliage, and which may be, and has been, considered a hybrid between an old self-colored show Geranium and a scarlet Zonal; but, as I have not followed out carefully the results of some crosses which I attempted in this direction a few years ago, I am unable to speak with certainty on the point, although the appearance, scent, and general want of fertility of the parent seedling indicate such an origin. In conclusion, I would ask hybridizers not to come to a hasty determination, from Dr. Denny's observations in crossing the Pelargonium, as to the prepotence of the male parent; for, although the doctor's experiments have been undoubtedly care-

fully conducted, and his observations on the results are equally reliable. I maintain that all such highly interbred plants as the Zonal, Pelargonium, the Rose, florists' flowers generally, and even cultivated fruits, afford no safe field for such a deduction, because reversion, and the causes alluded to by Mr. Darwin, are too likely to affect the results. On the other hand, after nearly twenty years' experience in the cross-fertilization and hybridizing of plants, during which time I have conducted, and, in many instances, carefully recorded the results of some thousands of crosses and counter-crosses with genera less interbred, and consequently less liable to reversion, and especially the Leguminosae, which are not easily subject to the accidental influences of foreign pollen, I have not been able to obtain any evidence that the influence of one parent, in the vegetable kingdom, predominates over the other, although I have had frequent proofs that the general results of cross and counter-cross are indistinguishable. The particulars of these experiments, I hope, if spared, at some future day to codify.

In allusion to the paragraph in the same page of *The Garden*, headed "A Blue Pelargonium," I must be allowed to repeat what I have before written, that I doubt the probability of a hybrid being raised between *Geranium pratense* and the Zonal Pelargonium. Eighteen years ago, I tried ineffectually to cross them in a variety of ways, using for the purpose Madame Vaucher and the principal whites of the period, both as the male and female flowers, and, although I have seen some of Mr. Lowe's seedlings, I must still give my verdict as "not proven."—*From the Garden.*

Bouquet Making.

Arranging flowers loosely and prettily and naturally in vases and other ornamental receptacles for flowers, is very easy work, requiring only good taste and some knowledge of the harmony of colors. As a rule ladies do this work well, and need no suggestions from us. The filling of baskets is a little more difficult, because more formal or artificial. First, line the basket with tin foil, or scatter a little lycopodium or other green material, to form a kind of green lining, and over this put a lining of strong paper. If the basket is not so open as to show the lining, a simple lining of paper will be enough. Then fill the basket with damp sawdust, rounding it off at the top and covering with damp moss, inserting the stems of the flowers in the moss. If the natural stems are not suitable for this work, the flowers can be "stemmed," that is, fastened to sticks, as recommended for floral designs. It is well to give an edging or border, mainly of green. Very few flowers have stems suitable for nice bouquet work, so it is the custom to "stem" all flowers, that is, give them artificial stems; and the material used for this purpose is broom-brush or wire, to which the flowers are attached with wool cotton or fine wire. These stiff stems can be made to hold the flowers in any position desired. To keep the flowers from crowding each other, and also to supply moisture, it is usual to wind damp moss around the stem of the flower at its connection with the artificial stem. The central flower, which is usually the largest, must have a stiff straight stem, for this really forms the back bone of the bouquet, as well as the handle. Fasten the stems of all flowers around this central flower.

After the flowers are all properly attached, and the bouquet formed, cut off the handle to the desired length and cover this with tin foil, or wind with white ribbon, leaving a loop, so that the bouquet may be suspended if desired. Ornamental papers, prepared for the purpose, are very pretty, and can be obtained at a small price of most florists. These cover the handle and bottom of the bouquet, and also usually make a quite ornamental border. Our remarks are, of course, designed for hand bouquets, but larger bouquets are made in the same manner, except that they are more pyramidal in form. Small bouquets, usually called button-hole bouquets, are becoming very popular and almost indispensable. They are worn principally by gentlemen, but to some extent by ladies in the dress and hair. They are made in two ways, of a single flower, such as a rosebud or tuberosa, with a leaf as a back ground, and also of several varieties of small flowers. The lower part or stem is sometimes wound with tin foil, and fastened to the coat or dress with pins. A better way, however, is to use the neat little button-hole bouquet holder, made of glass, of all colors, and attached to the dress or coat by the pin which belongs to the holder. These holders contain water, and keep the little bouquets fresh for several days, while the stems fit so tight to the mouth that no water can escape.—*Vick's Floral Guide.*

The Aster.

The aster is a universal favorite, and has steadily increased in popularity for half a century. The quality of the flower has also kept pace with its increasing popularity, until it has become almost as



large as a peony and as perfectly double as the best chrysanthemum or dahlia. Perhaps I can safely say that for an autumn display it has no successful rival among the annuals. Give the aster a deep, rich soil, and mulching with coarse manure is very beneficial. Plants may be grown in the hot-bed, cold-frame, or a seed-bed in the garden. They can be transplanted very easily. Twelve inches apart is the proper distance for making a showy bed of the large varieties; the dwarf kinds may be set six inches or less. The tall, large-flowered varieties need a little support, or during storms of rain and wind they are easily blown down when in blossom. Set a stick in the ground, close to the roots, and fasten the stem to it at about the centre. The top of the stake should be about six inches below the flowers, and it will not be seen.—*Vick's Floral Guide.*

The Pansy.

A popular flower with both florists and amateurs, giving abundance of bloom until after severe frosts, enduring our hard winters with safety, and greeting us in the earliest spring with a profusion of bright blossoms. It will flower better in the middle of the



summer, if planted where it is somewhat shaded from the hot sun; but in almost any situation will give fine flowers in the spring and autumn. If plants come into bloom in the heat of summer, the flowers will be small at first; but as the weather becomes cooler, they will increase in size and beauty. Often plants that produce flowers two and a half inches in diameter during the cool, showery weather of spring, will give only the smallest possible specimens during the dry weather of summer. To give good flowers the plant must be vigorous, and make a rapid growth.

No flower is more easily ruined by ill treatment or adverse circumstances. The fancy varieties are of fine habit, great beauty, and are well adapted to our climate. Seed may be sown in the hot-bed or open ground. If the young plants are grown in the autumn, and kept in a frame during the winter, with a little covering in the severest weather, they will be ready to set out very early in the spring and give good flowers until hot weather. If seed is sown in the spring, get it in as early as possible, so as to have plants ready to flower during the spring rains, and they will grow so large as to astonish you. Seed sown in a cool place in June or July, and well watered until up, will make plants for autumn flowering. The pansies make such a beautiful bed, and are so interesting as individual flowers, that we are anxious all should succeed with them. No flower is so companionable as the pansy. It requires no very great stretch of the imagination to cause one to believe that they see and move, and acknowledge your admiration in a very pretty knowing way.—*Vick's Floral Guide.*

How to Grow the Oleander.

The Oleander is a very ornamental plant when properly grown, but we seldom see fine specimens. There is scarcely one of my readers who has not seen dozens of tall, straggly plants. I propose to give a few directions by which fine plants may be grown.

Take a healthy cutting, place it in a bottle of water, and let it remain there till roots appear; then pot it, shifting it into larger sized pots as its roots require room. Do not try to have it branch until it blooms. It will then have a long, straight stalk—a good foundation for the plant you desire. After blooming, three shoots will start; allow these to grow, as these are the flower shoots. But after these have bloomed, cut back all the shoots to within four or five inches of the former branching place. Do this each time the plant blooms.

Two years ago we had a plant given us which was four years old and several feet high. In the autumn my husband remorselessly cut it down to within five inches of the first branching, but after starting the following spring it grew rapidly. The Oleander has many good qualities. It will bloom well for its owner all summer, and then after cutting down in the fall, may be put in a dry cellar for the winter, doing better during the following summer for its long rest. While growing it requires an abundance of water. It would be a good plan to allow it to stand in pans constantly full of water till after blooming, when water should be gradually withheld till cut in, and then it should be put in the cellar and no more water given it till the following spring. It is well to re-pot the plants every three years (just before starting them in the spring). If you do not wish them in larger pots, pare the ball of roots with a sharp knife on the sides and bottom, re-pot in strong, rich loam, and set in a shaded place, and in a few weeks the root will form anew.—*KITTY CLOVER, in Floral Cabinet.*

NEW STRAIN OF AMARYLLIS.—The varieties of Amaryllis raised from *A. pardina* are likely to form the most useful race of all. They flower very freely, which is not the case with the older and better known forms; and, better still, they flower freely in winter and early spring.—*The Garden.*

A NEW SNOW DROP.—There are now in bloom in Mr. Barr's bulb grounds *Galanthus plicatus* and *G. Imperati*, the latter a great advance on *plicatus*. It has the same broad foliage as that snowdrop, but the flowers are twice as large as those of *plicatus*. It may therefore be imagined what a gain it will prove for our gardens.—*The Garden.*

PLANTS with slender branches which naturally hang down, are the most suitable for hanging baskets. "Mother of Thousands"—the "Wandering Jew" with its pretty marked leaves—the Lobelias, and some of the trailing Campanulas or Bell flowers—the well-named "Rat-tailed Cactus," and the so-called "Ice-plant," are all more at home when suspended than when grown in any other position.

A FINE AMERICAN ALOE.—The *London Garden* figures and describes a fine specimen of *Agave Americana*, which flowered in open air in South Devon, in October last. It was forty-five years of age; began to show indications of flowering in May, the flower-stem subsequently grew three to four inches in a day, but slower afterwards. It was over four inches in diameter, reached a height of 25 feet 6 inches, and bore 6,000 flowers. The leaves were 6 feet long. Our readers will not be surprised that it grew in open air, when they bear in mind that the *Fuchsia* flourishes in South Devon without any protection, and sometimes attains a height of ten or twelve feet, and that other shrubs and plants requiring a greenhouse here succeed equally well.

Veterinary Department.

Structure and Diseases of the Horse's Eye.

The eye is the immediate organ of vision, and is situated within the orbit and surrounded by its appendages.

The globe or eyeball is of a spherical shape, and is composed of a membranous sack in which is contained transparent humors of unequal density. The outer tunic is formed of the cornea and sclerotic, the former investing the anterior portion of the eye, and is the only covering of that portion. The middle tunic consists of the choroid, iris and ciliary processes, and the inner or nervous coat is designated the retina.

The refracting media are the aqueous humor, crystalline lens, and vitreous humor. The sclerotic is dense, fibrous membrane, and gives the form to the eyeball, forming about four-fifths of the globe, and is attached the nervous tissues which move the eye. The cornea is a transparent membrane, and is composed of several layers.

The choroid or middle tunic is made up of three layers, two vascular and one pigmentary, and supplies the nutritive matter necessary for the internal parts. The retina is the nervous coat, and is formed principally of the expansion of the optic nerve.

The iris is a movable curtain, suspended in the aqueous humor, and serving to regulate the rays of light. It is generally of a brown color in the horse, and is composed of fibrous stroma, pigmentary cells and muscular fibres; the opening in it is known as the pupil of the eye, or pupillary opening, which is elliptical in the horse and ox; the muscular fibres of the iris have the power of dilating or contracting the pupil. The ciliary processes are prolongations of the choroid coat, and are arranged in a circle round the crystalline lens.

The aqueous humor, which is composed principally of water, occupies the compartments between the cornea and iris, and between the iris and crystalline lens; the compartments are designated the anterior and posterior chambers of the eye.

The vitreous humor occupies nearly four-fifths of the whole interior of the eye ball. This membrane is denser than the preceding, and is of the consistency of thin jelly. The crystalline lens is placed in front of the vitreous humor; it is very dense in structure, and enclosed in its own capsula. Attached to the posterior lining of the iris are several little black globular bodies called the *corpora nigra*, their apparent use is to modify the rays of light entering the eye.

The appendages of the eye are the eyelids, eyelids, *membrana nictitans*, conjunctiva and lachrymal apparatus.

The eyelids serve to cover and protect the eyeball, and the upper one is much the larger and more movable; they are formed of skin, muscles, and cartilage.

Situated in the nasal angle or inner corner of the eye, between the globe and the side of the orbit, is the *membrana nictitans* or haw, forming a marked peculiarity in the horse. This body is formed of fibro-cartilage of an irregular form, and is for the purpose of protecting the eye from injury, and also tends to wipe off any foreign substance from the surface of the eyeball when the eye is irritated. The action and structure of this membrane show the beautiful arrangement of nature for the protection of such a delicate part. The haw is sometimes cruelly removed by people ignorant of its use and purpose.

The lachrymal apparatus is formed of the lachrymal glands, which secrete the tears, the lachrymal sack, and the duct which conveys the tears from the eye to the nasal opening. This canal or duct is long and tortuous, and passes through the superior maxillary bone, terminating in a small opening on the inner surface of the nasal opening.

The conjunctiva is the name applied to the thin mucous membrane lining the eyelids and eyeball.

The muscles in connection with the eyeball are very numerous and complete, and allow it to move in every direction, the posterior muscle being exceedingly powerful.

Fomentations.

It is not an unfrequent occurrence to hear horse-men and others speak of having fomented a certain part or limb with cold water, and another will use the same expression in reference to hot water. Such is decidedly wrong, although it may be, and we believe is, generally accepted and understood. To foment a part is to produce excitement in it—to increase or quicken the circulation of blood, and thus relieve those parts suffering from congestion or inflammation, or, after such a stage as inflammation, to promote the formation of matter—pus—and ensure relief by its discharge by abscess.

The most simple remedy is heat, and we have already seen that one method of applying it is by means of certain substances forming what is known as simple, mercurial, or disinfectant poultices. Another kind of remedy very much in effective use is hot water, and we term its application "a fomentation." We do not need to qualify the term by the degrees hot or cold, a fomentation is always hot, for hot water excites and produces the action we want, but cold water depresses, producing an effect the very reverse of heat, and is, therefore, not a fomentation. Whenever we write in future articles of fomentations our read-ers will, we trust, understand we refer to hot water only unless otherwise specified, and when cold water is used a totally distinctive term will be made use of, by which mistake cannot possibly arise.

Fomentations, like poultices, are both simple and medicated. We notice first.

Simple Fomentations.

Hot water, varying from 110 deg. to 115 deg. Fah., or about 70 deg. Cent., is the simplest and most accessible fluid for a simple fomentation, and as the temperature is of the greatest importance, a thermometer should, if possible, be employed to ensure the precaution of not going beyond the degree named. Where numbers of animals are kept and hot water as much called for, a thermometer is a useful instrument for various purposes, and as the cost is now so trivial, it is easy to obtain one equally suitable for testing either the temperature of air or fluids, so that no one need make the matter a subject of much difficulty.

The water should not be too hot, because it may produce serious injury, and it should not be too cold, as all the time and trouble may be thrown away, with no good results; but when proper attention is observed, we may assert without fear of contradiction, that the best of simple remedies will bear comparison with fomentations for their rapid and powerful effects; and conversely, when hastily, improperly, and defectively applied, none prove so very injurious. In order to understand these propositions we must make use of a little repetition.

Hot and cold applications are equally opposed to each other. The first opens, relaxes, enlarges, and softens the parts to which they are applied, but cold water contracts, constricts, makes smaller and harder; therefore, when we use hot applications, we must be careful that the proper heat is maintained, not only during the use of the remedy but also afterwards, for the parts are then very sensitive, and, being moist, any cooling by exposure to the air brings on the very state we wish to avoid, viz., a *backening*, so called, of the inflammation. To excite first and immediately depress is very injurious, and delays the cure and progress towards health very much indeed.

Foot fomentations to be of use must be applied long and continuous. We often hear groom and others say, "I fomented for twenty minutes," and we seldom omit to add, "then you have probably done more harm than good." It is impossible in so short a space of time to impart to the substance of a limb, or mass of muscle, sufficient heat as will prove of any ultimate service. The parts are but just wetted, and often are left quite unprotected, by which serious harm follows. Fomentations should be persisted in for hours, and every arrangement and precaution made and taken before the application is begun. The efficacy of hot water may be usefully illustrated by the following case. Some time ago a valuable horse had become fast in the collar chain which secured him to the manger, and he, struggling, fell in an awkward position. Shortly afterwards, by his efforts to free himself, he hooked one of the hind shoes into the throat strap of the head collar, and he

was thus tighter than ever. This took place in the night, and the noise he made failed for several hours to call any one to the spot, but when he was found, he was growing very weak, and partly from strangulation and heavy bruises, his head and neck were as large as two. Besides, the breathing was much impeded, and it was at first a question whether the windpipe should be opened, and from the same cause it was absolutely impossible to expect him to swallow medicine. Our only course was to rely upon incessant fomentations, which were kept up for upwards of five hours, at the end of which time the swelling had considerably abated, medicine had been swallowed, and the patient took a small feed of oats. The plan of procedure was this:—A large copper being at hand, it was filled and the fire lighted; in the meantime, hot water was supplied from a distance. The horse was turned round in the stall and the head covered with two thicknesses of woollen cloth, and held over a large pail standing on a tub. Hot water was being constantly brought by one person who poured it in to make up the required heat as shown by a thermometer, and another was occupied in pouring the water from a large jug over the top of the head on the woollen cloth. By this means continuous heat was applied and no evaporation took place, which resulted, as we have already said, in the greatest good, after which a dry hood was put over the head and neck, the parts being previously rubbed briskly with soft dry towels.

For the legs we find a proper tub, known as a leg tub of the greatest value. In this the limb may be immersed for hours with ease, and to make it more effective the hot water should be passed to the bottom by means of a large funnel and pipe, or the cold will settle at the bottom. The ordinary plan is to simply stir it frequently as hot water is added. In the absence of a leg tub, woollen bandages may be bound over the limb, and hot water poured on the top will maintain a proper heat. Pieces of old horse rug, woollen cloth, several towels, &c., may also be used in emergencies, and a most effective action may be further induced by covering these with a piece of oiled silk or gutta-percha sheeting. Spongio-piline is the article which at once fulfils all these offices. The soft side being placed towards the affected part, the outer as waterproof effectually prevents any passing away of heat, and thus the proper excitement is set up and continued.

It should always be understood that when fomentations have been applied, the parts require to be dried as soon as possible by suitable friction and soft dry cloths, and a thick warm covering applied at once; for the legs bandages answer quite well, and for the body two or three ordinary rugs. To foment a part and leave it to dry afterwards is a bad proceeding and does great harm.—*Farmer (Eng.)*

A REMEDY FOR A HORSE THAT HAS EATEN TOO MUCH CORN.—Give two tablespoonfuls of salaratus dissolved in one pint of warm water, being sure to see that it is all dissolved. In severe cases give a halfcupful of salaratus and repeat the dose if the horse is not relieved in thirty minutes.

LINIMENT.—The best liniment for cuts, galls, spavin, poll evil, fistula, or any other of the external diseases that animals are liable to, is made by dissolving one ounce of pulverized corrosive sublimate and one ounce of gum camphor in one pint of spirits of turpentine, put in a strong bottle. Apply with a swab.

PULSATIONS PER MINUTE.—Wate's *Veterinary Pathology* gives the following as the number of pulsations in a minute, in a state of health, in the under-mentioned animals:—

Horse.....	32 to 38	Dog.....	80 to 100
Ox or Cow.....	25 to 32	Sheep.....	100
Sheep.....	70 to 76	Goat.....	110
Goat.....	72 to 79	Cat.....	120
Cat.....	110 to 120	Hare.....	120

REMEDY FOR SPITBACK OF URINE IN HORSE
In a bag one foot square put enough fine salt to form a thin layer over the side. Wet it with alcohol, or if not at hand use warm water. Place it over the kidneys, then wring out a blanket in very hot water and place it over the bag, covering these with several thicknesses of dry blankets to retain the steam. On all places the usual horse blanket. If relief is obtained in fifteen or twenty minutes, repeat the operation. Leave the outside blanket on after the others have been removed, till the horse is perfectly dry.—*Massachusetts Ploughman.*

Correspondence.

The Colorado Potato Beetle.

(To the Editor of the CANADA FARMER.)

STR:—When at work in my garden this morning, I picked up a full-grown larva of the Colorado Potato Beetle, which had under the body what at first sight resembled the spawn under a lobster, but on moving it on my hand it turned out to be a lot of young beetles, which commenced running about on my hand in a very lively manner, and of course I threw the whole brood into the fire. This fact may account for the beetles being so numerous when they first appear in the spring. I have noticed a statement that some one has found a bug that eats the potato bug, and then goes into the ground and attacks the potato, and now he is looking for a bug that will eat the bug that eats the potato bug, and I hope his search will prove successful. I find that apprehension is felt in England that whenever the potato beetle becomes as numerous in the eastern cities of the United States as they have been in the western cities, they will find their way on board the shipping, and so be introduced into England. Whenever they become numerous in Quebec, which can only be a question of time, they will find their way to England on the timber-laden ships which annually leave that port for different parts of the United Kingdom; and when this pest is added to the constant recurrence of the potato disease, the working classes in England will have to substitute the common dwarf white bean for potatoes. The beans are much more nutritious than potatoes, and can be largely raised in Canada if a sufficient demand for them should ever be called into existence. I observed in the *Globe* an account of a spider-killing insect which has been noticed on the fronts of the houses overlooking the Bay, and also that a similar insect had been noticed in New Zealand. I have no doubt that these insects are no other than the mud wasps, which are by no means scarce in this locality. It is out of the question to keep the windows of the upper rooms closed by day during the heated term, and those wasps find their way in and construct their habitations of clay to the annoyance of the occupants of these rooms. They certainly destroy a great many spiders, but the spiders are said to destroy bugs, so in that respect they are useful, although no cleanly housewife likes to see spiders' webs hanging about her rooms. I may add that the Colorado Potato Beetle has not yet become sufficiently numerous in this section of the country to seriously interfere with the cultivation of the potato crop.

This has been a trying winter for the fall wheat. In some places the farmers have commenced ploughing it up, but in other places it has stood the winter pretty well.—I am, &c., SARAWAK.
May 7th, 1874.

Removing a Wart.

(To the Editor of the CANADA FARMER.)

DEAR SIR:—A valuable mare of mine has a large wart growing on the outside of her fore leg immediately below the knee joint. I cut it off twice last summer, but it is now again as large as ever. It does not appear to cause lameness, but is a blemish nevertheless; and if you can suggest any means for its removal, I shall feel much obliged.—Yours, &c.,
J. W. B.

[Remove the wart with a knife, and then touch the roots with sulphuric acid, being careful in doing so not to injure the surrounding skin.]

BOOKS ON FARMING.—"H. H.," Uxbridge.—Wright's Illustrated Book of Poultry costs \$15, and Dadd's American Cattle Doctor, \$1 50. They can be purchased at any first-class bookstore.

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The Canada Farmer.

TORONTO, CANADA, MAY 15, 1874.

Our Dairy Products.

The season has now arrived when the manner in which dairy operations are entered upon and carried out will have a very important influence upon the profits derived from the year's husbandry. Anything, therefore, which may tend to enhance the value of dairy products, and any improvement in the processes of manufacture that will give them a higher value in the home and foreign markets, deserves careful consideration.

We wish, in the first place, to draw attention to the fact that Canadian butter—to which product of the dairy we intend to confine our remarks in this article—occupies a very inferior position in the European market.

Now, there is no good reason why all our dairy products should not rank as high as those of any other country in the world. In our last issue we quoted from the *Mark Lane Express* to show that our cheese occupies a position second to none, and brings fully as high a figure as any in the English market, excepting certain fancy brands such as Cheddar, Stilton, &c. Our farmers are as intelligent, enterprising and energetic as can be found anywhere; and if they can only be induced to devote a portion of their time and attention to the causes of failure and the means for remedying them, there will doubtless be a marked improvement in the quality of Canadian butter, and consequently better pecuniary results.

Generally speaking, so far as the majority of our farmers are concerned, the dairy occupies altogether an inferior position to any other branch of agricultural industry. So long as enough butter is made for home use, and to exchange at the store for groceries sufficient to meet the demands of the household, there is nothing more to be desired. Our farmers rarely consider what is the value, commercially, of their butter after it has left their hands. They carefully scan the home and foreign market reports, and the slightest fluctuation in the prices of grain attracts their attention at once, whilst the fact that Canadian butter occupies so comparatively low a position in the market entirely escapes their notice, or is con-

sidered of no consequence whatever. This is a great mistake, and causes loss to all parties concerned; in the first place to the farmer, who, if more are were exercised in the manufacture, would receive a better price for the article; and in the second place to the merchant, who often suffers severe loss from the rapidity with which it becomes rancid before he can dispose of it.

Up to the present time butter, good, bad and indifferent, has commanded the same prices at the country store; but a movement has been inaugurated amongst merchants to discriminate between the different qualities, and pay for it accordingly. In some places butter inspectors are appointed whose duty it is to place a value upon the article, giving a certificate to the vendor of the price it is worth, which will be paid by the merchant or consumer. This will doubtless produce good results. The painstaking dairyman will be paid a fair value for his butter according to its quality, and the slovenly and careless will receive the just value of theirs, and "nothing more."

The farmer is not the only party to blame for the stigma which attaches to Canadian butter abroad. The country merchant, as the article comes in, heaps all sorts, qualities and colors together, throws the whole into a tub, packs it close, covers it with a layer of salt, fastens it down, and sends it to market. No care is exercised in discriminating between the different qualities, packing that which most nearly approximates in color, &c., together, and utterly rejecting that which is badly made and inferior. One lump of bad butter placed in a barrel with that of the best quality will speedily taint the whole, and render it little better than rancid grease, altogether unfit to be put upon the table for household use.

To make good butter, cleanliness is of primary importance—in fact, it is the *sine qua non* of dairying. Next to cleanliness, is working the butter so as to remove all traces of the buttermilk, then salting, packing and storing—all require the most scrupulous care and attention in order to produce satisfactory results. The temperature at which the cream should be kept previous to and during the operation of churning must also be taken into account. In fact, to manufacture a first-class "gilt-edged" article requires an inflexible adherence to certain fixed rules, which our readers will find fully explained in a series of articles on the subject in the Dairy Department of the CANADA FARMER for 1873, and which will repay careful perusal.

There is one feature of dairy husbandry to which we wish to direct the attention of our readers, and which has produced very satisfactory results amongst our American neighbors. We refer to butter factories. Cheese factories have now become a permanent and flourishing Canadian institution, the benefits of which it would be difficult to over-estimate. Farmers have proved by experience that they receive better cash returns for their dairy products by this system than by undertaking all the trouble and care of making and marketing their cheese themselves. Why not, therefore, apply the same system to the manufacture of butter? We hope to see before another year these useful and, we may almost say, indispensable adjuncts to successful dairy farming, in full operation throughout the country, believing, as we do, that they will tend more than anything else to improve the quality of Canadian butter.

VICK'S FLORAL GUIDE.—The third number for 1874 of this charming and popular little work is fully up to the old mark. We cordially recommend it to all lovers of flowers.

THE Directors of the Western Fair Association have decided to hold the Fair this year at London, during the week commencing 29th September. About \$11,000 in prizes will be offered.

The Appointment of the Rev. W. T. Clarke.

It is with pleasure that we learn the appointment of the Rev. W. T. Clarke as rector of the Provincial Farm and School of Agriculture. The duties of the office are sufficiently important and onerous, embracing as they do the moral and domestic government of the pupils, the charge of the household arrangements, the chaplaincy, the treasuryship, and the correspondence; and could not, we feel sure, be entrusted to any one more thoroughly qualified to discharge them with zeal and efficiency, nor to any one who has displayed from the first agitation of the scheme a more lively interest in the establishment of the institution.

Mr. Clarke has already entered upon the field of his duties, and the actual work of instruction on the farm has commenced. In common with his numerous friends, we wish him "God-speed."

In connection with the appointment the *Graphic Mercury* remarks: "Apart from the strong claims he had on the Government for the great interest he has taken in this institution since it was first spoken of, and the efforts he has made to get it established, he is in every way well qualified to discharge his responsible duties with great efficiency; and we are satisfied will enter on his work with a zeal and earnest desire to make it a success. In sending their sons to the farm, parents may have every confidence that in addition to the valuable instruction they will receive, their moral welfare will not be overlooked; that the principal and rector will at all times study their comfort, and that while going through the daily routine of work they will also endeavor to elevate and refine those committed to their charge. We are confident that this appointment will give great satisfaction to Mr. Clarke's numerous friends in this section and throughout this Province, by whom he is well known in connection with his agricultural studies and writings, and for the active interest he has taken for years in promoting its interests."

The Great Flood at the South.

The damage resulting from the recent inundation in Louisiana appears to have been much more extensive and serious than was at first anticipated. Late southern exchanges state that an area of over five million acres of land, and the material interests of fifty thousand persons, are involved in the catastrophe. Hundreds have lost their stock, crops, and, in short, their all, and no fewer than sixty thousand individuals are destitute of the bare necessities of life. The Government, with commendable promptitude, at once forwarded five hundred thousand rations of meat, flour and vegetables to the unfortunate sufferers, and a steamer laden with further supplies was dispatched a few days later. A number of the leading seaboard cities have already responded in the most generous manner to the cry for assistance, and it is to be hoped that ere this the pressing necessities of the case have been fully overcome. What the ultimate consequences of this dire calamity may be, it is of course quite impossible at present to determine, but there is little doubt that it will very materially lessen the products of the south for this season.

Canada Live Stock in the United States.

Most of our readers will have observed, from the reports published in the two last issues of the *CANADA FARMER*, that a large proportion of the best stock disposed of at our recent sales went to United States breeders. Much as we regret the short-sightedness of our own people, in thus allowing the cream of our flocks and herds to be drained out of the country, it is very gratifying to know that those who have come, in some instances, thousands of miles, and risked so much in the matter, are perfectly satisfied with their bargains. Speaking of some of these purchases, the *Western Farmer* says:—

"B. Ogilvie, Esq. of this city, has just returned from a visit to Slansdale, Irvine, Wis., the home of George Murray, and his fine herd of Short-horns. The important man heifer 'Maid of Honor' purchased at Mr. Beattie's sale, will probably take the place of honor in the herd, as Mr. Murray, we believe, regards her as one of the finest Short-horns he had ever seen,

and Mr. Ogilvie seems to agree with him. She has dropped a fine roan calf since her purchase.

The Clydesdale Stallion Donald Dumieis pronounced decidedly superior to the representation of him recently published by us. We suppose it will be generally admitted that he is the best Clydesdale in America.

Mr. Murray has also just engaged in breeding Long Wool Sheep—having some 29 very fine Cots wools purchased in Canada.

Wm. Lysaght, Esq., Belleville, Wis., arrived at home last week with 61 Cotswald sheep purchased from the celebrated flocks of John Miller, Berril and Johnson, and Jas. Graham, of Reach, Ontario, Canada, at an average cost of \$60 each in gold. We understand that 60 of these are ewes, all young, and that several lambs accompany them. One of the ewes is spoken of as especially fine. She was a prize taker in England, and now has a very promising ram lamb. She cost \$110 gold.

Water Farming.

We extract the following from a letter of George H. Jerome, one of the Fish Commissioners of Michigan, to the *National Granger*:—

When the sea, the lake, and those unnumbered rivers and streams that bear their never-ceasing flood seaward, shall make such returns as they are capable of making, the immense increase in cheap, abundant food will tend greatly to harmonize the relations of capital and labor. It is estimated that the yearly catch, consumption and value of food in these countries alone is equal to \$120,000,000. Now suppose we put the fish at three cents per pound, it will give us 1,000,000,000 pounds of food. Suppose that we estimate the weight of meat cattle at 700 pounds each, and a pound of fish to be equal to a pound of meat, and we have hereas much food, all the uncultivated sea, as is equal to 5,750,000 cattle. Now to this add the yield of the whole sea, the lake, the river, the lakelet and the rivulet, and we have an amount of good brain, bone and muscle food almost beyond the range of calculation. If we except China, Japan and a small part of Europe, not a tithe of our great water-farm has yet been subjected to cultivation. Let it be cleared up, ploughed, manured, so to speak, scientifically tilled, and the choice varieties of stock introduced, and we will prove a given acreage of water to be equal in production and value to the same acreage of land. In the good time coming we may possibly hold our fairs, build our stalls, make our exhibits, wear our badges, appoint our "tasting and smelling" committees, and feel big generally, according to the fashion of the land.

A Good Farmer.

Unfortunately the general opinion as to who is "a good farmer" is that he who raises the greatest number of bales of cotton is alone entitled to the designation. He may exhaust his land to barrenness; he may never cut a ditch; he may never use any manure; he may ignore subsoil ploughs; he may buy all his provisions; he may never know whether he has lost or gained by his year's operations; he is "a good farmer" if he has raised several hundred bales of cotton, and fully ten bales to the hand. The 500-bale man is generally rated as "a right smart farmer," the 1,000-bale man is "a fine farmer," the 1,200 or 1,500 bale man is a "first-rate farmer," and the man who "runs ten places," "plants for 3,000 bales" and almost always makes his 11 bales to the hand, is "a planter as is a planter." Quantity, not quality, is the measure. Now any one of these men may have old fields on his places, washed and scamed with gullies; his houses, barns and stables may be wretched; all his appliances may be inferior; he may be over head and ears in debt, running behind every year; the sheriff may be waiting to pounce on him—the one fact that he makes a great many bales atones for everything, and planting success is made to depend on the size of the area planted. We form a different estimate. We pronounce only him a "good farmer" who improves his land every year; who attends closely to his business; who has fine stock well cared for; who has neat fences, tidy dwelling tastefully decorated and embellished, commodious barns and shelters, and plenty of meat and bread; who owes no man anything; can tell at the end of the year exactly how his account stands with each of his crops, and who has always on hand a manure heap growing daily in breadth and height. He may not raise more than twenty or even ten bales; he may be a poor "patch farmer," but he is infinitely a better farmer than the 5000-bale man who has no improvements, keeps no accounts, pays no attention to his business, and who owes his factor more than he can ever pay. We live in an age when "big" things only are con-

sidered admirable, when even big crimes are deemed less heinous than peccadillos, robbery of millions venial in comparison with petty larceny. Big crops are not always successes. Indeed, more frequently they are the proofs of bad and improvident than of good farming.—*Philip's Southern Farmer*.

English Short-horn Prices.

The twenty-third number of Mr. Thornton's *Circular*—just received—furnishes the data by means of which a comparison can be made between the Short-horn prices of this spring and those of the corresponding season of last year. The prices realized at the two Irish sales (reported in our last issue) show an advance of about ten per cent. for animals of exactly the same stamp as those sold from the same herds last season, and similar remarks will apply to nearly all the British sales of the season. The other contents of the *Circular* are as usual, except the notices of forthcoming sales, which are of more than ordinary importance.

CRUELTY TO ANIMALS.—A bill has been introduced into the House of Commons by Mr. Carleton, member for Halton, intitled "An act to prevent cruelty to animals while in transit by railway or other mode of conveyance in the Dominion of Canada." It provides that cattle, sheep, swine and other animals shall not be confined for more than twenty-eight consecutive hours without being unladen for food, rest and water, except in case of unavoidable detention from accidents or storm, and that the time allowed for food, rest and water shall not be less than six consecutive hours. The act applies to steamers and vessels where no space is allowed for food and rest. When the stock is unladen, the act requires that the car shall be cleaned of filth and offal, and shall be freshly littered with saw-dust or sand.

CROP PROSPECTS ABOUT HAMILTON.—The *Times* says in the vicinity of the city and the border townships the fall wheat is so badly winter-killed that a bad harvest must be the inevitable result. Some fields are so ruined that they will be re-sown with other grain. No spring crops have been planted yet, and ploughing is backward. The grass is badly injured, and the farmers talk of large prices for hay during the approaching winter. In most places the clover is killed off entirely, as the alternate wet and frost have heaved the very roots of the plants inches out of the ground. In consequence of this it is predicted there will be no clover crop this season at all. As a necessary result hay and clover cured last year are dearer, and prices will be higher before they are lower.

Few of our young farmers who leave this happy country with the object of improving their lot and settling down in the Western States are satisfied with the result. As a rule their experience is a bitter one, and after years of hard struggle with misfortune, they either come back to Ontario or long for means to bring them home again. We receive numerous letters telling us of this fact, and one received recently concluded with these impressive words:—"I wish I could sell out; money is mighty hard to get in the west. Emigration to this section (Missouri) is a grand humbug." We sincerely trust that should the emigration fever seize upon any of our farmers this spring they will consider the step before taking it, and remember that the Canadian Government offers advantages to the young farmer in the great Northwest equal to any to be obtained across the border.—*London Advertiser*.

EXPERIMENTS have been recently carried on in Scotland to test the adaptability of dynamite to land clearing in Canada, the object being to show that with the aid of this powerful agent the ground can be rapidly and thoroughly cleared of stumps and boulders. It was found that a charge of dynamite placed below a stump blasted it out with a very slight expenditure of time and labor, proving in fact more efficacious in this way than when the stump was bored and the charge placed within the wood itself. The trials of boulders were equally successful—all the stones were of hard, tough and compact white-stone, yet the dynamite cartridge reduced them to dust, or, in the case of large masses, to bits the size of road metal. It was stated at the conclusion of the experiments, by one Mr. Scott, of the Glasgow Canadian Land and Trust Company, that the new blasting agent could be used with great effect and economy in the land-clearing operations in this country.

Agricultural Intelligence.

The Fall Wheat Crop.

From the condensed statements given below, our readers will be able to form some idea of the present general appearance of the fall crop. We learn that in some few instances the crop has been ploughed down, and the land re-seeded for spring crops, but we trust the necessity for such a course of procedure has only been exceptional, and that a few warm spring showers and a few days of favorable weather will put a new face on things.

A large quantity of fall wheat will be ploughed up, but as a general thing this crop will be far from a failure.—*South Simcoe News*.

It is feared that the frost has injured the fall wheat around Carronbrook. This is to be regretted, as there was a great deal sown last fall.—*Stratford Beacon*.

The fall wheat in Wellesley that was put in with the seed drill is considered nearly all safe, but that which was hand sown is going to suffer badly.—*Stratford Herald*.

The fall wheat in this country looks very badly winter-killed, and, with the most favorable weather, will scarcely yield an average crop.—*Cuyuga (Haldimand) Advocate*.

We regret to learn that fall wheat is almost if not entirely destroyed throughout a large section of country by the extreme unseasonableness of the weather for the last few weeks. Many farmers are ploughing or harrowing and seeding again with spring wheat.—*Evo.*

The reports of the condition of fall wheat are, as usual, conflicting. The rye is represented as being both good and bad, and we are not in a position to decide which is which. We are not inclined, however, to credit some discouraging rumors.—*Harris Examiner*.

The fall crops in the neighborhood of Hespeler look somewhat consumptive. This was anticipated from the fact that fields were lying bare a good part of the season. It is to be hoped, however, that when vegetation once fairly sets in, all will recruit.—*Stratford Beacon*.

Fall wheat appears to be irretrievably damaged by the late severe frosts. It is now so badly wilted that in many places it is believed killed. It is best not to be too bold in asserting this, however, as a favorable spell of warm weather and refreshing rains might agreeably disappoint our fears.—*Peterboro Examiner*.

The long continued cold of the past month has been very injurious to the wheat crop. Accounts of its condition are very contradictory, some saying it is still safe, others that it will be a total failure; but some are always looking at the dark side, and it is to be hoped it will come out much better than is at present expected.—*Bobcaygeon Independent*.

From Oro and other townships in the neighborhood we have heard complaints of the damage done by frosts, and in some cases it is apprehended that the crops are totally destroyed. Being without the protection of the beautiful snow, the hard frost of a week ago was calculated to make itself felt on that standard cereal, which, up to that time, gave excellent promise.—*Orillia Times*.

The late arrival of spring has caused the almost total exhaustion of forage. Owners of horses in this neighborhood are compelled to go a considerable distance from home to obtain a supply. On Tuesday last, six teams left Oakville and vicinity to go to Hamilton for hay, and five of them were compelled to stay over night, there being only one load for sale in the market.—*Argus*.

Reports from the country are far from encouraging regarding the crops. The previous fine winter having cleared off the snow and left them to the mercy of the late hard frost, fall wheat in many instances is somewhat "scorched" and more or less heaved. A favorable spring will remedy the damage. Fruit-growers anticipate a good crop, as frost has not penetrated the ground to anything like the usual depth.—*Cobourg Sentinel*.

An agricultural friend of ours alleges that half the talk about the backwardness of the fall wheat is simply "bosh," and that it has a tendency to engender unnecessary fears. He insists upon it, that detrimental as may seem the frequent climatic changes through which we have recently passed, the crop is doing nicely—that is, as far as he has noticed; and from the minuteness of his details, we should say he has been taking close observations.—*Belleville Ontario*.

Great Horse Fair at Belleville.

The show of horses, on the grounds of the West Riding of Hastings Agricultural Society, at Belleville, on May-day, was one of the grandest and most successful affairs of the kind ever held in Canada; indeed, we question very much whether a finer display could be made anywhere else on the continent. The entries in the various classes were quite numerous, and the fact that all of the noble animals exhibited are owned by parties in the immediate district, reflects the highest credit on the stock-breeders of the county of Hastings.

An invitation had been extended by the Town Council to the Governor-General and Countess of Dufferin; in reply to which their Excellencies expressed regret at not being able to attend, owing to certain duties which, whilst Parliament is in session, require the personal attention of the Governor. This was the only disappointment of the day. In all other respects the anticipations of the managers were fully realized, and, as stated before, the fair was a decided success.

Among the animals exhibited, there were two in particular that attracted more than ordinary attention. The first of these was "Slap Bang," a beautiful brown stallion, 9 years old, and standing over 16 hands high, the property of Mr. J. M. Fearnley. He is of course an out-and-out thorough-bred, with splendid pedigree, and was purchased last season in England for \$5,250. The other was "Thunder," formerly the property of the late Mr. Shedden, of Montreal, and now owned by Messrs. A. & J. Brodie. A handsomer pair of horses it would be very difficult to find in America. The following are the awards:—

Blood Stallions.

1st prize (gold clasp with scarlet ribbon), J. M. Fearnley, "Slap Bang;" and in addition to the above prize the judges subsequently awarded three scarlet ribbons, in acknowledgment of his superior stock; 2nd prize (blue badge), A. & J. Brodie, "Stirling;" 3rd prize (white badge), Charles Traver, "Tipoo Clarion Chief."

Stallions—General Purposes.

1st prize (gold clasp with blue ribbon—Mayor's prize), Hugh McQuoid, Murray; 2nd prize (scarlet ribbon), Major Gillum; 3rd prize (white badge), W. T. Lake, Pieton, "American Boy."

Draught Stallions.

1st prize (silver medal with white ribbon), W. Johnston, Foxboro'; 2nd prize (blue badge), H. T. Mitchell, Foxboro'; 3rd prize (white badge), Wharton Jarvis, Madoc.

Matched Carriage Horses.

1st prize (ladies' prize—driving whip and scarlet badge), Henry Pretty; 2nd prize (blue badge), R. Gibson, Murray; 3rd prize (white badge), McLougall Bros., Thurlow.

Single Carriage Horses.

1st prize (driving whip and scarlet badge), W. C. Jones, Belleville; 2nd prize (blue badge), Wm. Powers, Canifton; 3rd prize (white badge), J. Hawley, of Hawley House.

The judges highly recommended the horses belonging to the following persons for their excellent appearance, &c.: W. E. Holton, Belleville; Jacob S. Knox, Sidney; J. M. Hurley, Tyendinaga; J. B. Moore, Commercial House, L. W. Yeomans, H. Bleeker, Sidney, Wm. Donnelly, Belleville, R. C. Fairman, Canifton, and A. R. Gilbert.

Draught Teams.

1st prize (steel plough), presented by W. H. Wallbridge, Victoria Foundry) Roy & Hunt; 2nd prize (blue badge), Dorland Clapp; 3rd prize (white badge), Roy & Hunt.

Saddle Horses.

1st prize (scarlet badge), L. W. Yeoman; 2nd prize (blue badge), John Forin; 3rd prize (white badge), Robt. Read, jr.

The first prize in the above class was a silver cup, presented by Major Gillan; but it was not awarded, the judges considering that the horses did not come up to a first or standard; and it was reserved for competition in the next fair, when we hope the animals will be largely represented, and better trained.

Ponies.

1st prize (English bridle), H. C. Filliter; 2nd prize (blue badge), W. H. Garratt; 3rd prize (white badge), J. Phillips, Blessington.

Township of Vaughan Ploughing Match.

The annual Ploughing Match in connection with Vaughan Agricultural Society, took place on May Day, and was attended by a large concourse of the leading farmers of the neighborhood. Fifteen ploughmen competed, with the following results:—

CLASS 1.—1st prize, Simon Shunk; 2nd, John Smith; 3rd, H. Whillie.

CLASS 2.—1st prize, John Weldrick; 2nd, John Lahmer; 3rd, R. Wudhe.

CLASS 3.—1st prize, H. Keiffer; 2nd, D. Smith; 3rd, J. McMurphy.

BOYS' CLASS.—1st prize, John Campbell; 2nd, Alfred Lahmer.

Mr. Hugh Thomson, of East Nissouri, recently lost an imported cow, valued at \$1,000. Indigestion, caused by overfeeding, is supposed to have been the cause of her death.

The Nova Scotia Board of Agriculture have resolved to establish an Alderney or Jersey Stock Register, under the same rules as those in force respecting Registers of other thorough-bred stock.

A CALIFORNIA farmer, according to the *Rural Press*, cut sixty tons of hay from 16 acres of lucerne, pastured fifty calves three months, and harvested fifty bushels of seed. Good for California, or "any other man."

CHINAMEN are employed in California as draught animals. Two Chinamen are harnessed to a wooden-toothed rake, which thus answers in lieu of a harrow where the ground is too wet to use the latter. Over a thousand acres have been treated in this manner in Contra Costa county.

The spring show of stock for the East Riding of Elgin took place at St. Thomas on Tuesday and proved a great success. A large number of entries were made in the blood-horse class. Simon Beattie's imported thorough-bred stallion, "Fiate," carried off the first prize, "Sir Archy" second, and "Harper" third.

An exhibition of draught horses took place at Nantes from March 9th to March 15th. This exhibition was reserved for horses from four years to six years old, bred in 16 departments. Prizes were offered at this Nantes meeting to the aggregate amount of \$4,000. At a great central horse show to be held at Paris this month, prizes will also be given to the amount of \$14,600. The French are evidently applying themselves in earnest to the improvement of their breeds of horses.—*Bulls Messenger*.

ADVANCE IN HORSES.—A contemporary says:—"We recollect very well that when railroads were first being built in the interior of New England, farmers thought that horse raising would no longer be profitable, and many breeders of our acquaintance acted on this belief, and either raised no colts at all, or much less than they had formerly done. Everybody knows that these fears were not realized. Horses have been in greater demand and prices have been much higher since the completion of railroads than before. The same appears to have been the case in England, as it is stated that the London General Omnibus Company has purchased 22,026 horses in the last twelve years. From 1861 to 1870 the average price was about \$120 each. In 1871 the average price was \$140, and in 1872 nearly \$165. Until 1870 the needed supplies were easily obtained in England and Scotland. For eighteen months past nearly all the horses bought have been purchased in France.

MORTALITY AMONG CATTLE.—A large number of cattle around Seaforth are dying at present from various diseases, most of them being produced by a lack of good nutritious food. The grass was poor last summer and the cattle came up in the fall in bad condition, and being poorly fed this winter from the scarcity of food, there has been a great number lost—mostly cows in calf. In fact, it is feared that at least one in six of all the cows in calf in this section will die. The first symptoms they present, says the *Expressor*, are an inability to get up and apparent weak legs, but, in reality, there is a weakness of the whole nervous system, which is frequently seen in cows heavy with calf, from the heavy drain on their system. A good many young cattle have died from similar causes. On being examined after death, their stomachs are found to contain a large quantity of sand, taken up with the roots of the grass last fall, causing indigestion and a number of other diseases.

STOCK SALES.

Burghley Park Short-horn Sale.

The sale of the Marquis of Exeter's Short-horns at Burghley Park, Stamford, brought together a large company of breeders and fanciers from all parts of the country. A number of the cows offered showed age, and consequently did not bring very high figures, but the bulls—most of whom had for sire Telemachus, prize winner at the Hull Show of the Royal Agricultural Society, last season—sold well, at prices varying from \$63 to \$357.

SUMMARY.

	Average.	Total
15 females	\$254	\$3,817
14 bulls	210	3,350
29 head	\$247	\$7,167

Sale of Mr. J. J. Hetherington's Short horns.

The attendance of breeders and farmers at the Middle Farm Sale of Short horns, Brampton, Carlisle, was very large, and the bidding, though somewhat flat at first, became, towards the close, exceedingly spirited. Nine of the Gwynne family realized the handsome sum of \$5,826, or an average of \$647; Polly Gwynne, by Barrington Oxford 2nd, (27988), going to Major Webb, at \$1,076, and her calf to Mr. Fox, at \$971.

SUMMARY.

	Average.	Total.
42 females	\$310	\$13,020
7 bulls	132	921
49 head	\$284	\$13,941

Sale of Mr. Robert Jefferson's Short-horns.

This was in reality a sale of bulls, to which a number of cows and heifers were added, as also a select herd of eight head belonging to Mr. Gunson, of Whitehaven, Cumberland. These eight realized an average of \$327, the highest price being \$551, given by Mr. Topper for Wild Eyes Gwynne 3rd, a beautiful red and white heifer, whose only fault apparently was "the want of a pocket handkerchief." The bulls were mostly by Knight of the Shire, hired from Mr. Booth, of Warlaby. They sold at from \$135 to \$377.

SUMMARY.

	Average.	Total.
43 females	\$231	\$11,098
17 bulls	236	4,012
63 head	\$233	\$15,110

Sale of Mr. John Henry Casswell's Herd at Loughton, Folkingham.

The animals at this sale were brought out in fine condition, the heifers in particular presenting an appearance scarcely to be surpassed. The top price was \$172 for a cow of Mr. Rowland Wood's breeding, but of Pawlett's blood, through her sire. She was purchased by Mr. Braikenridge, of Somersetshire.

SUMMARY.

12 Cows averaged	\$239	Total	\$10,032
21 Bulls	202	"	4,239
63 head averaged	\$230	Total	\$14,321

Sale from the Forest Home Herd of Mr. J. G. Hagerty, Hanover, Ohio.

This sale took place on the County Fair Grounds at Newark, and was attended by the leading stock-breeders of the state and a number from Pennsylvania, Virginia, Kentucky, Indiana and Illinois. The stock went chiefly to local buyers.

SUMMARY.

38 Females averaged	\$321 29	Total	\$12,205 00
8 Bulls	270 00	"	2,160 00
46 head averaged	\$312 28	Total	\$14,365 00

Short-horn Sale at Geneseo.

The first annual sale of pure-bred Short-horns, by the Geneseo Valley Stock Breeders' Association, was held last week (April 22nd) at Geneseo, N. Y., on the grounds of the Livingston County Agricultural Society. "In point of stock shown and sold," says the *Rural Home*, "it was a fine success; in point of prices realized, it fell below expectation. The attendance was large, including many Western New York stock fanciers, some from Pennsylvania, two or three from Kentucky, and a few from Canada and remote localities; but the bidding was not spirited, and of the thirty-two fine animals sold but two or three brought what might be called fair prices, while those which called out the highest bids were knocked down at figures considerably below those offered at private sale. The sale was in every respect fair, no animal being bid in, and none being led from the ring unsold that were competed for. Whether the experiment will be repeated remains to be seen. That the Geneseo Valley is a first-class section for the breeding of Short-horns is an accepted fact, and that it will become yet more noted in this specialty is hardly less certain. Mr. A. M. Winslow, the celebrated Vermont breeder, thinks of removing to Geneseo, and has already transferred a portion of his herd there. One or two other breeders are likely to add their herds to the Geneseo Valley's attractions."

The following is the summary:—

THE PROPERTY OF MR. C. F. WADSWORTH.

Hetty 2nd, 10 years, Harris Lewis, Frankfort	\$160
Hetty 2nd, and calf	223
Hetty 7th, W. B. Dodge, Waukegan, Ill.	200
Hetty 6th, do	115
Tuberosa 7th, A. M. Winslow & Son, Putney, Vt.	560
Tuberosa 10th, C. Parish, Wilkesbarre, Pa.	210
Tuberosa 11th, W. B. Dodge	220
Bell Flower 7th, do	175
Bell Flower 9th, do	169
Average of the nine, \$227—Total	\$2,015

THE PROPERTY OF MR. J. W. WADSWORTH.

Fineste, Geo. Robins, Buffalo	\$505
Campajee 3rd, J. B. Craig, Edinonton, Can.	300
Mystery, do	710
Pearlette, Harris Lewis	175
Average of the four, \$322—Total	\$1,690

SALES BY OTHER BREEDERS.

Rosella 3rd, do	\$91
Rosella 5th, do	125
Belle of Avon, 128 Village Belle	70
Belleflower, 148 Virginia 2nd	90
Vesuv, 28 Vista 2nd	38
Vesuv 2nd, 98 Heifer	75

BULLS.

C. F. Wadsworth's Prince of the River, M. B. Bitter	\$160
C. F. Wadsworth's Prince of the River 2nd, Jas. Miles	100
Five others, at \$65, \$70, \$75, \$85 and \$105	400

SUMMARY.

22 cows and heifers, average, \$193—Total	\$4,511
7 bulls and h. calves, do 94 do	660
32 head, average, \$175—Total	\$5,611

Sale of Mr. Senior's Devons.

This herd, says the *Mark Lane Express*, was sold by Goldsen & Son at Broughton, near Aylesbury, on Thursday. The cows and heifers made from \$63 to \$162 each, but some of the highly fed beasts made better prices, one intended for exhibition reaching to \$173, and another to \$252.

JOHN PYGALL, of Bayham, has nine ewes that have given birth to twenty-two lambs this spring—four triplets and five twins.

MR. JAMES BURGESS, of the township of Blenheim, has wool clipped from a year old ewe lamb which measures 14 inches in length.

Two ewes belonging to Mr. James McLauchlan, near Mount Forest, a few days ago gave birth to nine lambs—one giving birth to five and the other to four. Owing to a scarcity of proper nutriment two of each "family" died, the remaining five are doing well.

The following private sales from the Rosendale herd of Short-horns, Wis., are reported in the *Western Farmer*—Gabriella, light roan, aged 7 years, to J. K. Scribner, Eldorado, for \$325; Rosendale Lady, red, aged 2 1/2 years, to J. Torney, Fennimore, for \$600; and Bloom 3rd, red, aged 3 years, to Wm. Scribner, Rosendale, for \$250.

MR. ISAAC ULLYOTT, Missouri, has sold his young horse "Cannaby Champion," to Mr. William Jeffry, of Illinois, for the sum of \$800. He was sired by "Old Cannaby," the property of Mr. Thomas Evans, and was rising three years old.

MR. CALVERT KNAGGS, of North Norwich, in this county, recently killed a twin heifer two years old, which weighed, live weight, 1,350 pounds, and after being dressed, 1,000. The heifer was an improved grade, and had been purchased a few days previous to being killed for \$65.

J. H. HOLDEN, Sidney, Warkington, has sold to Messrs. Kilmer, Rowand & Co, Walkerton Co., Bruce, Ont., the fine young Ayrshire bull Nestor, for \$225; also, a splendid Ayrshire cow, Lady Cuthbert 4th, for \$300; and sucking calf for \$100. Mr. Holden has just received four very fine young Ayrshire bulls, bred from the 1st prize animals of Scotland.

FIVE HUNDRED AND TWENTY-FIVE DOLLARS FOR A FOAL.—Last week, Mr. Bruce, Newton of Struthers, Forbes, gave \$525 to Mr. Lawrence, Thornhill, Forbes, for a horse foal only a few days old. The foal is a very promising one of "Bell," a six year old brown mare, which, in the possession of Mr. Start, Camelon House, Stirling, carried the second prize at the Highland Society's Show in July last.

SOILING CATTLE.—There is no more economical mode of feeding cows for the dairy than soiling; that is, growing crops to be fed in the stable, the cows to be not pastured but exercised in a small yard daily. By this system one cow can easily be fed the year round from the product of one acre of rich soil, and the manure saved is equal, including the litter, to one load per head per month.—*American Agriculturist*.

SALE OF STOCK AT "THISTLE HA".—Mr. John Miller, of Thistle Ha, Pickering, has sold the fine three-year old bull, "Strathallan," to Mr. Lockridge of Greencastle, Ind, for \$2,500; the five-year cow, "Sixth Duchess of Winfield," and bull calf, to H. B. Groom, of Winchester, Kentucky, for \$700; and "Second Duchess of Springwood," to Mr. Sanborne, of Port Huron, for \$600. Mr. Miller also sold to Mr. Lysaght, of Wisconsin, one imported ewe, two years old, for \$120, and another of his own breeding and lamb at \$115; two shearing ewes at \$30 each, and a shearing ram at \$75.

DARK NOSED SHORT-HORNS.—J. P. Reynolds, in the *Prairie Farmer*, quotes Allen's "History of Short-horns," to sustain his opinion that a dark colored or black nosed is no evidence of impurity of blood in a Short-horn. He says, however, that the prejudice is so strong against them that he would not tolerate a black nose in a first class herd. It is undoubtedly true that some very well and fashionably bred Short-horns have dark noses. We have in mind one marked case, where the sire is one of the high-priced bulls of the country and the dam a very well bred cow.

SALE OF JERSEYS.—A sale of thorough-bred Jersey stock, comprising about forty bulls, cows and heifers, took place recently at the Bussey Farm, the home-stead of Mr. Thomas Motley, West Roxbury, near Boston. The animals offered were among the best of their breed in New England, having been selected by Mr. Motley himself whilst on a visit to Jersey land. The roughness of the day, which was very cold and stormy, did not prevent the attendance of a large number of dealers, and the sale passed off most satisfactorily. Mr. Sargent, of Boston, purchased two cows at \$300 and \$500; and Mr. Ellis, of Framingham, six head at prices equally good. The bulls did not sell so well, the highest price being \$90, and one of the best in the ring was knocked down at \$72 50. The whole proceeds of the sale amounted to \$4,935.

JERSEY AND ALDERNEY.—The unfortunate confusion of ideas as to the proper nomenclature of these cattle will probably exist for some years to come, and make it necessary for this oft-repeated statement to be re-repeated a hundred times. Alderney was formerly understood as referring to any cattle from the Alderney group of islands, Jersey, Guernsey, Alderney and Sark. As the cattle are really distinct breeds, and have been very strictly kept so for many years, the name of each island is now, and has for some years been given to its own particular breed of cattle. Jersey and Alderney are therefore two distinct breeds. The same trouble is now laying in regard to Dutch and Holstein cattle, which are Dutch only when they are large, black and white, heavy-milking cattle from Holland, and Holstein when they are red, brown, and other colored beef cattle from Holstein.—*Am. Agriculturist*.

The Dairy.

Making Good Butter.

The great scarcity and high price of good butter will undoubtedly stimulate production. A good article will, without doubt, command remunerative prices during the whole season. The better grades are never a drug in the market, while those grades usually denominated grease butter cause a loss to country merchants, which they must make up in an advanced price on goods given in exchange; not to mention the disgust created in those who are unfortunate enough to buy it. Nevertheless there is no reason why fully three-quarters of the grease butter that comes to the market might not have been at least free from rancidity, for rancidity results principally from want of care in the churning and packing.

One of the principal mistakes with butter-makers who do not have conveniences for all the details of the art, is that they continue to churn too long after the butter is formed, persisting often until the butter is gathered into a solid, compact mass. A better way would be when the old-fashioned churn is used, as soon as the butter is well formed, or when it does not stick to the dash, to turn up the churn and strain the buttermilk through an open cloth. This cloth should have been previously wetted first with hot, and after with cold water. When sufficiently drained, set the churn again on its bottom, take a pail of the coldest water you have and pour into the churn slowly from as high an elevation as possible. Then fill the churn nearly full of water, to dilute the buttermilk as much as possible; then gather the butter into a mass, and work and salt at the rate of one ounce of salt to each pound of butter. The next day, the butter may have another slight working, when it is fit for market or packing away. Of course, if a good modern churn be used, the washing may be accomplished with less trouble; the buttermilk may be drawn from the hole at the bottom of the churn and the water also after washing. The object of pouring the water into the churn from a good elevation is to enable it the more thoroughly to permeate the butter globules and free them from the buttermilk.

In packing the butter, do so in such a manner that the air can find no lodgment between the different layers or about the sides of the package, and keep it in a cool, sweet cellar until sold.

If care be taken that the milking be cleanly done, and that no foul odors come in contact with the milk and cream thereafter; if strict cleanliness be observed with the various utensils employed; and equal care be taken that the butter be not worked to such a degree as to render it salve; and if those having the handling of the article between the producer and consumer would take good care of it, there would not be so much complaint about the greasy, odorous, often loathsome article miscalled butter that too often finds its way to otherwise respectable tables.

While it is true that really first-class butter cannot be made without especial attention to temperature, etc., which all cannot have, it is equally true that all may make really good butter, generally up to the first of July, if proper care be taken to preserve strict cleanliness in all the operations. The *Western Rural* does not advocate the excessive washing of butter, but we should certainly dilute the buttermilk, so as to render it innocuous to the butter. This is simply rinsing, a very different thing from working the butter in water as is sometimes practised.—*Western Rural*.

Creamery Plans and Practice.

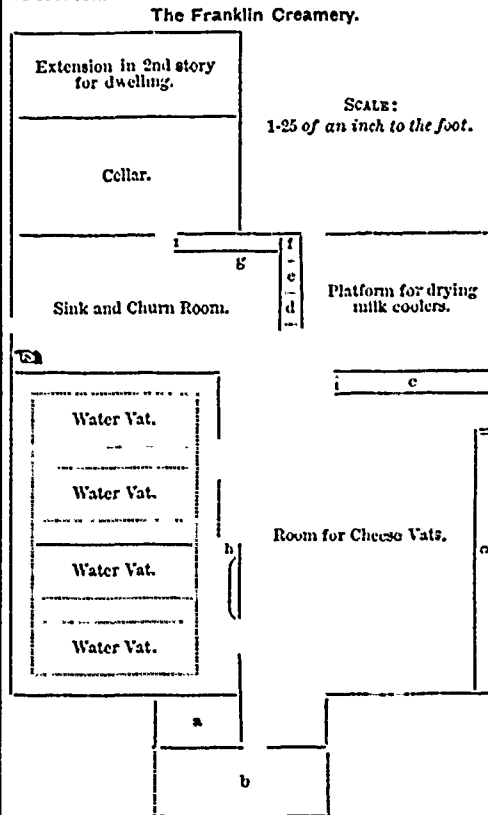
BY E. S. MUNSON, OF DELAWARE COUNTY.

Most of the creameries of this State make butter and skimmed cheese, and the few creameries where only butter is made have indisputable relationship with the cheese factories proper, by a graded system, where are made a large proportion of butter and the veritable "white oaks," up to those where a small proportion of butter is made, but a cheese claimed to be as good as any from whole milk. Thus, one pound of butter to twenty-five pounds of milk would give a white oak, and one pound of butter to thirty of milk a close skimmed cheese, and the proportion of butter to milk thus lessens, until we come to factories where only the night's milk which has stood in the cheese vat, is skimmed the following morning. As to the comparative profits of the different systems I need not remark in this article, more than to say that it will hereafter depend, as heretofore, not only upon the relative prices of butter and cheese, but upon the quantity of skimmed cheese made in

the country. It is by no means the smallest or least intelligent class of those having interest in the business who deprecate the making of skimmed cheese to any considerable extent, being fearful that the reputation of our American cheese abroad would suffer to such extent as to very much lessen the foreign demand.

At the Franklin creamery we make about one pound of butter to thirty pounds of milk, souring our cream before churning, hence putting the buttermilk into the whey for feeding swine, and the sweet (skimmed) milk is made into cheese, producing 1 1/2 lbs. to 1 3/4 lbs. of cheese to 1 lb. butter. More cheese can be made by churning the cream before souring and putting the sweet buttermilk into the skimmed milk for cheese, but I am yet to be convinced that the gain by so doing is sufficient to make good the loss in both quantity and quality of the butter.

Having thus briefly outlined our system, I will here insert a draft of our building which, in its general features, I think cannot be very much improved. To draw a full plan and proper specifications for the builder to work from would require too much time, and also a knowledge of the grounds where it was to be located.



Water vat room 24x38.
Cheese vat room 36x38.
Churn room 16x38.
Cellar 16x28.
Engine house 10x12, located outside the main building to the left of the churn room as indicated "a".
a is elevated platform for weighing milk.
b is extension of roof over teams when unloading milk.
c c cheese presses
d e f sinks for hot and cold water.
g work sink.
h receiving vat.
i indicated "e".
j is elevated platform for weighing milk.

Whole cost of building and apparatus at war prices of 1867, was nearly \$9,000.

Creamery Practice.

Milk is drawn from the weigh-can into a receiving vat, and from vat into coolers or tin pails 20 inches deep, 8 inches diameter, which as they are filled are set into water vats for raising cream, standing 12, 24, 36, and 48 hours depending upon the temperature of the water, which should be not higher than 50°. The quantity of water must depend upon amount of milk. For a patronage of five to six hundred cows there should be sufficient water to fill a two inch hole when running off, without pressure. More creameries fail for want of a supply of cold water than for any other reason.

By all means use steam power for churning, as the steam from the boiler can be used for heating cheese vats, scalding butter packages, and the many other purposes that will readily occur to the mind of a practical cheese maker. We use a six horse power portable engine, and find it ample for all purposes with a patronage of six to seven hundred cows.

In the Franklin creamery we manufacture butter and cheese for the patrons and are paid by the pound, and the produce is turned over to a selling committee. As long as patrons have confidence in the owners or

proprietors, that seems to be a fair and reasonable arrangement. In creameries where the proprietors buy the milk, different rules for fixing the price are followed. Some agree at the beginning of the season upon a certain definite price, but more of them buy upon one of the two following plans, viz: The proprietor to pay the patron for every ten pounds of milk delivered, each week or month two cents less than the highest price of a pound of cheese in the New York market, as quoted during such week or month in the paper or price current agreed upon. Ten pounds of milk is a liberal allowance for one pound of cheese, but two cents per pound for the expenses of manufacture and marketing cheese, is insufficient to cover actual cost. That the liberal and the liberal allowances correct each other and make fair terms between patron and proprietor I am disposed to believe.

Another plan practised to some extent in the localities of cheese factories, is to agree upon a certain factory of good reputation where milk is made into cheese for the patrons by the pound, and when their net cash dividends are made monthly or otherwise, then the proprietor of the creamery to pay his patrons the same price per 100 lbs. milk for the same time. Either of the last two rules seemed to be upon a very fair basis, placing the responsibility of manufacture and the risk of market values where each properly belongs.

One word more to any person about to build creameries. First, count the cost and don't expect to build and equip one without money. Go to a first-class creamery, take with you (if not on your own shoulders) a first class mechanical head, and stay long enough to take memoranda of everything useful to know, and all the better if you have the cheese maker or manager along to suggest improvements. Seek to employ an experienced cheese maker if you intend to make skimmed cheese; and after you have a good creamery and experienced workmen, do not take the false idea into your own head, nor teach your patrons that the creamery branch of dairying is so much better than any other, that it will surely lead to sudden and abundant riches.

Concerning Dairy Profits.

The average amount of butter per cow of the best half of the dairies of this county will not go above, and I think will fall below 150 lbs. for 1873, and allowing 25 lbs. of milk to 1 lb. butter, we have 3,750 lbs. of milk per cow for the season. The same amount of milk in our adjoining county (Otesgo) will produce 375 lbs. cheese; hence by looking back to the relative prices of butter and cheese for the past season, a person can not only form a judgment of the comparative profits of the two branches of dairying, but can get a reasonable idea of the average income of the dairy farmer in the state of New York.—*Utica Herald*.

Washing Butter.

We will look at the processes of those who do and those who do not wash their butter.

1. In describing the system of a very successful dairyman in Western New York, L. B. Arnold states that he receives 5, 15 and 20 cents above the highest quotations in the New York city market, keeps the temperature of his milk room so that in the hottest day the mercury never stands above 65°, and is kept from falling below 60° by a stove in winter, washes his butter with soft cold water 50°, and does not use ice or running water; this butter is a fancy article of the best quality.

2. A writer (Fall Butter Making) in the *Country Gentleman*, giving the results of several years' experience in butter making, thinks that while it hastens the removal of the buttermilk, where made in large quantities, it detracts from the sweetness of the butter, which the writer adds may be made up by the addition of an ounce of fine white sugar per pound.

3. "Some good butter makers never wash their butter at all, only in very hot weather," writes another.

4. "Don't put a drop of water on; it injures the flavor," writes one in the *Rural New Yorker*.

5. From a report of the operations of the Swedish butter factories, it appears the practice of washing the butter is not followed.

6. In the Massachusetts Agricultural Report, 1872, A. W. Cheever, (whose average of butter per cow per annum is over 200 lbs., which is twice the average of the whole country,) feeds grain to his cows every day, with green rye, fodder and hay, and always washes his butter in cold water as soon as possible after churning, to remove all the milk.

7. Another intelligent writer recommends the removal of the buttermilk from the churn, the pouring of water on the butter to be agitated and renewed until the water runs off clear.

8. A German paper says that a great portion of the

fine flavor of fresh butter is destroyed by the usual mode of washing, and recommends a thorough kneading for the removal of the buttermilk, and a subsequent pressing in a linen cloth.

9. At a meeting of the North Western Dairyman's Association, J. Boies, (who makes 300 pounds of butter per cow,) stated that he washes the butter till it is free from buttermilk.

10. At same meeting, Captain Tuttle denounced the practice of washing butter, as it takes away all the flavor. "people who cannot make butter without washing it had better leave it alone," he said.

11. A correspondent of the *Cincinnati Gazette*, says that washing butter drives out the milk more readily, saves labor in working with a lade, and assists in retaining the aroma and grain of the butter.

12. F. D. Douglas, of Whitney, Vermont, one of the best of farmers, a high authority, and a practical dairyman, removes the buttermilk while the butter is still in the churn, and repeatedly adds water—ice water in warm weather—revolving butter and water together.

13. The *Horn Journal* thus discusses the question: "We approve of washing butter as it comes from the churn, that is, using so much water upon it while properly working it with the lade or butter worker as will remove all traces of buttermilk. When buttermilk comes as it should, but very little water is required to take out the buttermilk. When the moisture that flows from the butter is clear as the water that is poured upon it or is not discolored as it passes off, the washing process is completed, and no more water should be used. Excessive washing injures butter, and of course some judgment in the matter is necessary. We are aware that many good butter makers are opposed to washing butter, holding that some of the more delicate flavoring oils are carried off by that process, and consequently that washed butter has not that fine aroma which unwashed butter possesses. Possibly this may be in some instances, but as there is always danger of over-washing butter and spoiling the grain in feeding it of buttermilk without the use of water, while at the same time there is danger of not expelling the buttermilk, we think it safer and better to wash it. A large majority of butter makers who make "fancy butter," wash the butter. Washed butter keeps better than that which is unwashed. This has been proved over and over again by the fancy product made under the two systems, both of which come into the London market. Butter in which there is a large proportion of casine retained, will not keep well for any considerable length of time, and a common sense view of the matter must show that washing most readily frees the butter of its casine.

14. L. B. Arnold, of New York, of large experience and good authority in dairy matters, says: "The idea that it washes out the aroma of the butter is more fanciful than real, and certainly much less injury is done to the texture by washing out the buttermilk than by working it out."

"When the butter is taken from the churn it is thoroughly washed in cool water before salting; however much washing butter may be condemned by others, it certainly works well at the creameries."

15. J. J. M., in *Journal of the Farm*, puts water with the butter in the churn to gather it, after drawing off the buttermilk, finds that it saves much labor in the subsequent working and doubts that it injures the butter.

16. At the Brooks Butter Factory, Little Valley Village, Cattaraugus county, New York, water is added to the butter in the churn twice, and the butter ransed by rocking, before it is taken out and salted.

17. Col. George E. Waring, of Ogden Farm, who gets one dollar a pound for his butter, one of the first American authors and farmers, and a scientific and successful cattle breeder and dairyman, runs off the buttermilk from the churn, leaving the butter within and repeatedly adds water—sometimes three times—to the butter, rinsing and working when the churn with the paddles, this "consolidates the mass and removes most of the buttermilk;" in addition to this repeated washing in the churn, after the butter has been placed on a table for working, a large sponge, wrung out of cold water, is repeatedly applied to take up any buttermilk which may remain.

18. We see one butter maker washes his butter with sweet skimmed milk, because it is not injurious to the flavor of the butter.

Here is the testimony of seventeen witnesses, eleven of whom are in favor of washing the butter with cold water, to remove the buttermilk; and simply eleven to six does not show all the weight in favor of the plan; among the eleven are the best writers and dairymen in the country: Col. Waring, A. W. Cheever, J. Boies, F. D. Douglas, L. B. Arnold, E. C. Brooks, &c.

The six who do not approve of the plan are represented by only one name, Captain Tuttle, of the North Western Dairyman's Association, the other five are anonymous communications to the agricultural press.

We think this decides the question so far as a general principle is concerned, but not necessarily and unalterably for the practice of each individual; it is supposed that those who oppose the practice as injurious to the aroma of the butter have some good ground for their opinion, and of the course to be pursued each individual should be governed by individual experience, following that plan which they find giving the best results. Our own practice has been to work out the milk instead of washing it out; we have very cold water, (51°), feed bran and turnips, get the cream at proper temperature (62°), the butter comes hard and requires very little working. It is claimed in one section that washing butter—except in very warm weather—makes it rancid, hence the practice is not followed.—*Maryland Farmer*.

Experiments in Setting Milk.

We quote the following from a correspondent of the *Buffalo Live Stock Journal*: "The cows experimented with were of the common stock, were stabled during the test and fed with dry hay and ten quarts of boiled oats each per day.

1—November 3. Set 5½ lbs. of milk 7 inches deep, 40 hours: result in butter, 3 lbs. 9 oz. or 2½ lbs. of milk to one of butter.

2—November 4. Set 90 lbs. of milk 1½ inches deep, 36 hours, and had 5 lbs. 1 oz. butter, or 18 lbs. milk to one of butter.

3—November 5. Set 87 lbs. of milk 1 inch deep, 36 hours: got 5 lbs. 13 oz. butter, or one pound of butter from 15 lbs. of milk.

4—November 12. Set 92 pounds of milk ½ inch deep, 36 hours: had 5 lbs. 8 oz. butter: one pound of butter 17 lbs. of milk. The temperature of the milk soon ranged from 55° to 65° during the experiment."

1st. We wish to call attention to the above statement.

Was the milk in test 1 placed in cold pure water 7 inches deep?

The advocates of deep setting are advocates of deep water invariably. Was water used at all in this experiment?

2nd. "The cows were fed and stabled during the test" says the preamble. The 1st experiment, November 3—if the cows had previously been running out on scant and frosted grass exposed to the rigors of October in the inclement weather of the north, it would not be a fair test suddenly to stable and feed highly, and put the first mess of milk in deep cans as a test of the system.

3rd. The first test was November 3, and the result of that test is compared with the results of messes put in pans November 4th, 5th and 12th.

We have before us the result of some experiments of our own in which the percentage of cream varies in one day, in milk from the same cow three per cent.; in milk from another cow, the variation the same day was five per cent. of cream; how much greater the variation would be likely to prove after an interval of the one, two and nine days between the first and the remaining tests?

By further reference to our experiments and tests we find, to strengthen the above suggestions, that in the milk from the same cow on different days (June 1st and 2nd) there was a variation of five per cent. of cream, and in the milk of another cow the variation (June 1st and 2nd) was ten per cent. of cream; the variation in another cow, in milk drawn in one day, was seven per cent.

4th. The cows would be more likely to give an increased quantity of butter after their systems had been invigorated by the high feed and had grown accustomed to it (and had perhaps recovered from the unfavorable effects of a sudden change from bad to very good feed) even by the same system, mentioned in test 1, and we find that the product continued to improve at each successive test, (except the last) from 26 to 18 then to 15 pounds of milk for a pound of butter; we cannot attribute this favorable change to the different depths at which the milk was placed for reasons set forth in the third section of our remarks.

5th. We notice the range of the thermometer was from 55° to 65° during the experiments; were the forty hours mentioned in test 1 more unfavorable in consequence of heat or moisture or other atmospheric conditions to the rising of the cream, than the 36 hours mentioned in tests 2, 3 and 4?

6th. It will be seen according to the statement (test 3), that the best yield of butter was from milk set only one inch deep. We think the impracticability of setting milk an inch thick under proper

conditions, especially in large dairies, will prevent this test from having any bearing in practice. Whatever the facts upon which the above statement is based, we think the statement itself does not show that the results of the experiments evince the superiority of the shallow pan over the deep can system.—*Maryland Farmer*.

Does Feeding Turnips affect the Taste of Milk and Butter?

The following replies to this question appeared in a recent issue of the *Country Gentleman*—

I would say that feeding turnips to milch cows in small quantities, and at intervals, would not be apt to affect the milk. I have had considerable experience in the matter, and find this to be the fact.

J. B. P.—Turnips will not hurt milk or butter in the least, if fed just after milking. I have fed half a bushel at a feed without causing any turnip taste.

H. S. K.—In regard to turnips fed to milch cows affecting the taste of the milk and butter, I would say that if fed in sufficient quantity to do any good to the cows, it will affect the taste. M. C. S.—I have fed turnips in small and large quantities, and have never known it to affect the taste of the milk or butter. We have sold milk and butter to our customers, who would be very likely to say something if it were tainted. J. H. N.—I have fed two cows for the past month or more with turnips, twice a day, without having any taste of them either in milk or butter. My plan is to give them after the cows have been milked in the morning, and the same at night.

D.—I feed at present 12 quarts per cow once each day, and that is fed immediately after milking in the morning. I have been in the practice of feeding turnips in this way for several years, without any bad taste in the milk or butter. I commence feeding lightly and increase up to one-half bushel if desired. I feed, in addition to the turnips at evening, 2 quarts of corn and oats ground into fine meal to each cow, and plenty of early cut timothy and clover hay. I am able to produce an article of butter that finds a market at several cents per pound above the common winter made butter. I find the orange mangold the best root to feed for butter-making, as it gives a very rich color to the butter, which I prefer to coloring with the juice of carrots. I think it a great loss to any farmer that keeps cows if he fails to have a good root crop. I winter our hogs well on Swede turnips.

In fact, we have no stock upon the farm but what have their turnips; even young calves that are being raised soon learn to eat them, by slicing the turnips fine and putting a little meal upon them. F. BOWEN.

LAST fall pigs should be fed very liberally at this season, in order that when they are turned out to grass or clover, they may be strong and vigorous. If they are fat now they will keep fat all summer on good clover.

PURIFYING MILK.—An *American Agriculturist* correspondent says that wood charcoal is an excellent absorbent of the disagreeable flavor of garlic in milk. He uses it every spring by dropping a piece three or four inches long and two inches thick into each pan of milk, or into the pitcher in which milk for table use may be kept.

STRAINING MILK.—This may seem a very simple subject, and one that most people think they can do well enough in their way, but I think there is a more excellent way than that practised by a great majority of our farmers. I find that most all of our milk raisers are content to simply let the milk run through a wire sieve or strainer attached to the pail. I don't care how neat a person tries to be during the operation of milking, there will be always a little fine dust or particles which will go through the "strainer pail" perhaps almost unnoticed. But let it sit for a short time, then look at it through a magnifying glass or with the naked eye, and it would almost surprise one to see the dust and specks that will be visible. Now my method is to strain all the milk through a coarse cotton cloth or linen strainer (in addition to the one in the pail) fixed over the snout of the pail so as to let it run through both at the same time, and I find there is a great difference in the looks of the milk, and in the color, flavor and quality of the butter, when farmers strain their milk in this way instead of the other. Now, if you want purer milk and sweeter tasting butter, some that will sell higher in the market, just try the cloth strainer and see the difference, and especially where the cows are stabled.—*Cor. Mirror and Farmer*.

Breeder and Grazier.

Comparative Feeding Properties of Green Fodder and Hay.

The practical experience of every stockholder, says R. W. in the *Agricultural Gazette*, has probably taught him that green fodder is far more nutritive than hay. In the main this opinion is undoubtedly correct; the question is, however, a somewhat complicated one. Green crops are fed or cut for fodder in all stages of their growth, the mowing or pasturing being entirely regulated by the requirements of the stock. Hay, on the other hand, is never made till the green crop has reached the point of its maximum growth. An animal fed on green food thus generally consumes the forage plant in a younger and less mature condition when it feeds on the same plant in the form of hay. Now chemists have shown that the difference in the age of a plant generally implies a considerable difference in its composition, and that with fodder crops there is a rapid increase of hard vegetable fibre as the plant approaches maturity, and a corresponding decrease of albuminoids (muscle formers), and of sugar, and other soluble matters. We will illustrate this by giving two analyses of lucerne used in some feeding experiments we are about to describe. The two samples of lucerne were taken from the same field in the early part of June, one 11 days later than the other. The analyses refer to the perfectly dry plant.

	Earlier Sample.	Later Sample.
Albuminoids	18.31	17.81
Fat	3.18	2.37
Extractive matter	43.02	39.46
Woody fibre	25.34	32.29
Ash	9.65	7.97

We might easily have selected analyses which would have compared more strikingly than the above, but these show sufficiently what an important change in the composition of a fodder crop may take place even in eleven days. The practical lesson from these facts has been often enforced, it is that crops intended for hay should be cut as soon as blossoming has fairly set in. To allow the blossom to get old before cutting is to pass the period at which the maximum amount of digestible food is obtainable.

The facts just stated have an important bearing on the comparison of green fodder and hay. It is evident that these can only be fairly compared when both are obtained from a crop of the same age. Professor G. Kuhn, of Moeckern, has conducted two series of experiments on this principle, the earlier experiments with red clover, the latter with lucerne. Two oxen were gradually brought to a diet consisting of green clover only; they each received 100 lb. per day. As soon as the clover in the field came into bloom the scientific part of the experiment commenced, and hay was henceforward made each day in the field. At the end of fifteen days the feeding with green clover was stopped, and the same oxen then received the hay which had been made at the time that the green food was cut, the quantity of hay given to each ox being regulated so as to contain the same weight of dry matter as the green fodder of the previous period. By comparing the analysis of the food with the analysis of the excrement during the last week of both diets, when the animals had become accustomed to the foods, the proportion digested was ascertained. The figures in the following table show the amount digested of each constituent for 100 supplied:—

	Green Clover.	Hay.
Albuminoids	72.5	69.7
Fat	75.1	72.3
Extractive matter	79.0	74.3
Woody fibre	58.2	52.0
Total dry matter	66.4	64.0

The experiments with lucerne were also made on oxen, and were conducted in a similar manner; the results were as under:—

	Green Lucerne.	Lucerne Hay.
Albuminoids	81.2	78.4
Extractive matter	76.0	70.6
Woody fibre	44.6	38.9
Total dry matter	64.0	59.1

It will be seen that in both experiments the results are slightly in favor of the green fodder; the differences, however, are not greater than are often observed in the same animal fed with the same food at different times. Moreover, the oxen had really a slightly better diet with the green food than with the dry, notwithstanding the care taken to make the experiments uniform, for the animals rejected some of the coarse stalks in the green food, but could not do this with the hay, which was supplied as chaff. The author, therefore, concludes that the feeding value of hay is sensibly the same as that of the green food it

is made from, assuming, of course, that the hay is well made, and neither loses its more delicate parts by too much knocking about in the field nor suffers injury from rain.

If fodder of the same age has practically the same feeding power, whether green or dry, the result is very different when fodder of different ages is compared. Professor Wolff fed sheep with green clover during the four weeks in which the clover was in blossom. The proportion of the clover digested at the commencement and end of this period was as follows:—

	Clover commencing Blooming.	Clover ending Blooming.
Albuminoids	75	68
Fat	64	44
Extractive matter	73	70
Woody fibre	50	38
Total dry matter	69	56

The age of the plant thus makes a wonderful difference in its digestibility. It will be noticed that the fibre, fat, and albuminoids suffered most in digestibility with advancing age, and the soluble extractive matter suffered least.

We see from these results that the feeding value of albuminoids, or fat, or any other constituent of fodder, may be very different in different foods. Chemical analysis, in telling us how much fat or albumin a food contains, does not therefore determine its nutritive power, the analysis is of considerable use, but we must at the same time take into consideration the nature of the food. As a general rule, the ingredients of seeds have a higher nutritive value than the ingredients of green fodder, and these again a higher value than the same ingredients contained in straw. Analyses should, therefore, mainly be used for comparing a food with others of the same class, as seeds with seeds, straw with straw; analysis cannot safely determine without experiment that a sample of straw is more nutritive than a sample of hay. We will illustrate these facts by some recent experiments of F. Heidepriem. This investigator fed mutton sheep on various diets of lupine straw, lupine hay, and lupine seed. Lupine is probably not very familiar to the British farmer as a fodder crop, we will therefore give the composition of the food before giving the results obtained by feeding:—

	Lupine Straw.	Lupine Hay.	Lupine Seeds.
Water	10.34	9.11	10.07
Albuminoids	6.23	23.53	43.35
Fat	1.10	1.99	3.87
Extractive matter	35.63	29.43	25.55
Woody fibre	43.40	25.56	13.33
Ash	3.24	10.33	3.53

* Containing 0.26 of sand.

Lupine is a highly nitrogenous plant; the hay considerably exceeds the clover in its amount of nitrogen, and the seed is the richest in nitrogen of all ordinary leguminous seeds. Out of the five diets employed by Heidepriem we will select three—lupine straw alone, lupine hay alone, and a mixture of lupine hay and seed. The proportion digested for 100 of each constituent of the food was as follows:—

	Lupine Straw.	Lupine Hay.	Lupine Hay and Seeds.
Albuminoids	37.5	74.3	77.5
Fat	39.2	30.4	39.6
Extractive matter	65.0	61.6	73.2
Woody fibre	50.6	73.4	66.2
Dry matter	55.0	67.6	70.1

Allowing for the measure of irregularity unavoidable in digestion experiments, we have here a uniform rise in the digestibility of the food as its quality improves. Thus not only did the hay supply much more albumen than the straw, but the albumen it contained was nearly twice as digestible as that in the straw. The seeds could not be used alone, but calculation from the comparative experiments without seeds shows that nearly the whole of the seed was assimilated by the sheep. The great feeding value of oilcake is in like manner due, not only to its composition, but also to its easy digestibility.—N. B. A.

Rules for Shearing.

We have been asked for directions as to how to shear sheep. However "at home" we may feel in the sheep barn, or on the shearing floor, we confess to feeling somewhat at "sea" when trying to impart information at so long range. Shearing a sheep is one of the things that needs to be seen to be appreciated. There is no mystery about it, but it is, nevertheless, a trade that has to be learned by practice. The novice who has determined to become a good sheep-shearer, should provide himself with: 1. A good pair of shears (avoiding cheap ones). 2. A plentiful stock of patience. 3. A pair of "overalls." 4. A smooth-cutting whetstone. If we were required to add to the above, we would say—a little

more patience; for it is the nervousness and impatience of the workman that, in nine cases in every ten, lead to the cramping and crowding of the sheep, which begins struggling for relief; thus adding to the confusion and tediousness of the operation of shearing.

Even among accomplished workmen, there are different practices in the operation of shearing. Some commence work on the brisket, others on the neck; some at the top of the head; and still others lay bare the belly first—laying the sheep down on the left side; keeping its head down by drawing its right fore foot across the neck, and holding it with the left hand. Some shearers use a bench or table, fourteen to eighteen inches high, upon which the sheep is placed; though a majority prefer to keep the animal on the floor during the operation. We recommend the latter, as it is equally as easily learned, is no more tiresome, and the table or bench is not always so readily improvised. The man who learns without it is always ready for work; the one who learns to use it is often at a disadvantage.

After having acquired some skill in handling the shears, and learned how to hold a sheep in the various necessary positions without hurting it, the novice may try the several points we have indicated for "opening the fleece" and adopt the one that best suits him (we prefer opening on the neck), leaving the back and sides to be sheared last. The sheep must be handled so that, in its kicking, it cannot break the fleece, which should always come off whole. The shears must be held flat, and not crowded faster than the eye can follow—leaving no spot to be gone over the second time. Speed will come with practice; but should never be sought at the expense of thorough workmanship. It is an easy matter for a slouchy workman to leave the value of his wages on the sheep, by cutting too high at some points and failing to trim neatly the flanks and legs—and he generally does it.

The shearing floor is the best of all places for ascertaining the shearing qualities of the different animals of the flock; and the practical flock-master will have an eye to his interests by there deciding which animals are to make a return through the butcher, and which are to be held for breeding and shearing, another season.—*National Live Stock Journal*.

A Beautiful Incident.

The intelligent horse, says the *Turf, Field and Farm*, very often sympathizes with animal distress. About a year ago, a dog was set upon by a crowd of cruel boys and pelted with sticks and stones. The poor dog had given no offence, but this mattered not. He tried to escape from his tormentors, and had nearly succeeded in doing so, when a stone hurled with great violence struck him on the fore leg, bruising the flesh and fracturing the bone. The animal howled piteously, but none of his persecutors went to his relief. Having injured him, they turned coldly away and left him to his fate. The dog limped into the stables of Mr. Kilpatrick, moaning piteously. In one of the stalls of the stable was a well-bred young horse of more than ordinary intelligence. The distress of the dog seemed to move the heart of the horse to pity. He bent his head, caressed the canine, and inspected the broken leg; then with his fore feet he pushed some clean straw into one corner of his stall, and made a soft bed on which the dog was induced to lay himself down. A close and affectionate intimacy was at once established between the horse and the dog. The horse was being largely fed on bran mash; and one day when receiving his feed, thinking the dog might be hungry, the equine bowed his head, caught the canine gently by the skin of the neck, and with his teeth lifted him into the trough or box. The dog fell to with a hearty will, which showed that his hunger was great, and gratitude was equal to his appetite. Days and weeks passed, and the dog and the horse continued to be firm friends. The bran mash fed them both, and the invalid grew strong and fat on the wholesome diet. At night the two animals thus strangely brought together slept in the most lovable manner. The horse would arrange a soft bed for the dog, and then lay down and tenderly encircle the canine form with one of his fore legs.

It is seldom that such a beautiful and authentic incident is brought to our notice. The horse showed for the unfortunate more of that feeling which we term humanity, than did the dozen youths who were presumed to walk in the image of God. Nay, it took the poor victim of man's persecution to his heart and home, and tenderly nursed the same back to health and strength.

Profit of Cut and Cooked Food over Uncut and Uncooked Food.

Proportioning the young stock by what they eat with full grown cows, we find we have a stock of 42 full grown animals, and they consumed 259 bundles of fodder on an average a week; corn meal 30 bushels, and bran 1,000 lbs.

250 bundles corn fodder at 6 cts	\$15 00
30 bushels meal, 25 bushels corn	16 00
1,000 lbs bran	12 00
3 days' work for one man, at \$1 25 per day	\$3 75
Coal, 4 ton per week	2 50
Interest on \$1,000, for 26 weeks, per week	4 00

Total expense for one week for horses and cattle, counting extra time spent in cutting and cooking \$53 00
15 bushels corn for pigs, made into mush at 50 cts. 7 50

Total expenses for all stock one week \$60 75

I know some Chester county dairies that feed 2 1/2 bundles of corn fodder per day to each cow, with hay in the stables, whose cows do not look any better than my own, if as well; but we will count the fodder alone:

42 head, 2 1/2 bundles fodder per day, making 735 bundles per week at 6 cts	\$44 10
Some quantity corn and bran	28 00
Man's labor on 20 bushels for cows, 30 bushels for pigs at 16 for grinding, waste not counted	3 30
One-fourth of a day for man to go to mill, waste and tear not counted	75
Extra feed for pigs one week taking as much more corn	7 50
Two hours extra time required to feed	1 87

Total for one week uncut and uncooked \$85 52

In favor of cooked food \$27 77; or about \$650 for the winter season.

Besides this, the cows would not look as well, nor do as well in any way, for they do no better than mine when they have hay twice a day. In addition to this, the maure would not be as good, and perhaps we might have lost some of our best cows at calving. There is no feed equal to it for young cattle and for milk cows. It keeps the hair short and glossy, the skin loose and mellow, and the animal healthy in general; looking more so though they were on grass than upon winter feed.

We intend soiling entirely this coming summer, and have already nearly all our inside fence torn away to make good the live ones left. We have 130 acres of land, 100 of which are tillable. We propose keeping 40 cows, some 20 head of growing stock, 5 horses, 40 or 50 thorough bred pigs for shipping, and some good poultry. — *Cor. Practical Farmer.*

Is Occasional Change of Pastures Desirable.

We copy the following from Proceedings of Central New York Farmers Club. If any of our dairymen have experience on this point we shall be pleased to hear from them:

“Dr. L. L. Wright, of Whitestown, said, ‘I believe it is now conceded that cattle do better by being confined to one pasture during the season than by changing from one field to another, as has at times been recommended. This is at least decidedly in accordance with my experience. There should therefore be but one pasture for cows, unless they number over 75 in a dairy, under which circumstances it may be preferable to divide them. Thus, on ordinary farms, more than one pasture is unnecessary for cows; another should be used if young cattle are reared, or horses or sheep. The meadow had also better be in the same enclosure with the plough-land, thus necessitating only three large lots for a farm of several hundred acres even.’ The Hon. Samuel Campbell was much interested in the statement that it was conceded that a single pasture was better for the dairy herd. He had supposed that a succession of pastures was approved, but was glad to know otherwise. Messrs. Bonfoy and Shull approved the one pasture system. The cattle are not restless, they are not subjected to the danger of over-feeding, and there is better soil. Mr. Morgan Butler would in the future have but two fields—ploughed land and meadow in one, and pasture in the other. He would not turn the cattle on the meadow until the crops are taken from the ploughed land. We cannot, he added, stand the burden imposed by the cost of fences. It must be reduced. Dr. Wright thought the two-field plan might answer for uplands, but the grass would grow too rank on the Mohawk flats, a flood might come, wash the sand among the grass, and the next year's crop would be short. Mr. Cleveland remarked that if he had his life to live over he would not build so many fences. ‘Remove all your fences and soil your cattle,’ said Mr. Cleveland.”

Buying a Short-horn Bull.

Our opinion has often been expressed that in no way can a farmer so readily and cheaply improve the size, shape and value of his stock of common cattle as by the use of a good Short-horn bull. It is not necessary that such a bull should be especially fashionably bred. He should be well bred and a good animal. He need not be a high priced bull, but he will and ought to cost more than a steer of the same weight is worth for beef. From \$100 to \$300 will buy such bulls, especially if fashion in pedigree and color be not made essentials. Better bulls can be obtained for more money, but a farmer, or two or three farmers who feel poor, can get a bull sometimes nearer the lower than the higher priced named.

In selecting a bull for such a purpose, we should not make great size an essential—should rather choose a medium sized and rather compactly built animal; looking especially to depth and roundness of body, well developed hind quarters, back, flank, etc. At same price a young bull is to be preferred. — *Western Farmer.*

Swine—Breeding Sexes at Will.

A correspondent of the *Indiana Farmer*, who has been reading a work on the subject of breeding sexes at will, in which the writer claimed that animals bred during the early part of the heat would bring females, while those bred during the last of the heat would produce males, gives the result of experiments in this direction which would seem only slightly to bear out this theory. He says:

For years past I have been so feeding my breeding stock as to have both boars and sows as vigorous as possible about the breeding season, and, as far as I can arrange it, I have the sows to come in heat as near the same time as feed and being kept near company will bring it about. My boars are confined so as to restrain them from over service.

Of my breeding stock last fall, I bred ten of my sows, in the first flush of heat, to three boars, all under as high feed as they would take, and all on both sides in good condition for breeding. The result of this breeding was thirty-six boars and fifty-four sow pigs, or eighteen more sow pigs than boars. If there had been nine more boars and nine sows, then the result would have been even as to sexes. I give a full list of the ten, that your readers may have the variation of the result in the test:

	Sow Pigs.	Boar Pigs.	Total.
1	6	4	10
2	7	3	10
3	9	2	11
4	7	1	8
5	4	6	9
6	6	4	10
7	5	6	11
8	2	4	6
9	4	3	7
10	4	5	9
	51	36	90

There were six sows that brought more sow pigs, three that brought more boars, and some of equal number of pigs each. There is no mistake as to their all being bred as above stated, as they were closely looked after three times per day by myself. I particularly look after my own stock during the serving and farrowing season, and would like some of the advocates of the theory to do the same and give the public the result, which may be more favorable to the theory under different circumstances.

Mutton vs. Bacon.

We have never been able to account for the strange prejudice among our people against mutton—one of the most palatable, digestible and wholesome meats. An exchange paper, commenting upon some errors of dieting among farmers, says truly, that “a great many tillers of the soil drag out miserable days, simply because they will persist in eating salt pork, and salt hams and shoulders, in spring and summer, when a dish of good mutton would give them new life and strength.” We mean to repeat a thousand times, or at least till what we say has some effect upon our countrymen, that a pound of lean, tender, juicy mutton can be produced for half the cost of the same quantity of fat pork; that it is infinitely healthier food, especially in the summer season, and that those who eat it become more muscular, and can do more work with greater ease to themselves. We know nothing more delicious than smoked mutton hams of the Southdown breed of sheep. Venison itself is not superior. By smoking a portion of the flesh of a sheep, most families can dispose of the four quarters in an economical manner before any part of it would spoil. — *Tennessee Agriculturist.*

Root Crop for Milch Cows.

Which to the space of land is the most profitable to cultivate for milch cows, the ruta-baga turnip or beets. Which will produce the most milk and best quality?—L. L. HASSLELL, Orange Co., N. C.

The preference in flavor and quality of milk is on the side of the beet; and where the soil and culture are especially adapted to it, the preference in quantity is also with the beet. In a very rich, mucky soil, ruta-bagas and turnips will give the larger yield; in a light loam, especially a sandy loam, beets will yield best. On a loamy soil, not highly manured, the Hon. Harris Lewis raises 40 tons to the acre. This is more than could be obtained from that either of turnips or ruta-bagas, and indeed more than most beet raisers realize. Mr. Lewis is especially skillful in the cultivation of the beet. He uses refuse ash as a fertilizer and a protection against drought, sowing it once or twice in the dry part of the season, broadcast, at the rate of about 300 pounds to the acre. Successful beet raising also depends very much upon a judicious selection of varieties; the Orbitant Giant, Yellow Ovid, White Silesian and Vilmorin's Improved White are among the best. The yield of turnips also depends largely on the variety selected. Beets have another advantage on the score of aiding digestion. It is a point in bovine digestion that while the food lies in the first stomach, or pouch, waiting, or rather preparing for remastication, it should undergo a certain amount of fermentation. This fermentation is the first step in the process of digestion, and the acid developed is a direct and essential agent in stimulating the activity and strength of the gastric juice, when the food reaches the true or fourth stomach. The large amount of sugar in the beet contributes essentially to the requisite fermentation, besides furnishing an abundance of material for producing fat. Ruta-bagas and turnips are not altogether destitute of the same properties, but they possess them in an inferior degree. All are excellent, especially when fed in connection with dry food, and ought to be more extensively cultivated by dairymen, both for winter feed and for soiling. — *L. B. ARNOLD in N. Y. Weekly Tribune.*

HOLLOW HORN.—Saltpetre, one tablespoonful; blood-root, same; both ground fine. Give it in a mush; for three mornings if they do not lick themselves, repeat the dose.

THE PREVENTION OF HOG CHOLERA.—The *Rural World* says that one of the largest hog breeders in Missouri, who frequently has several hundred head at once, never has any sick. He gives them salt, just as he does other stock. In cooking food for hogs—which he does in a large wooden boiler holding thirty or forty bushels—he has the coals and ashes thrown in the boiler and boiled with the food. He also sometimes puts in salt and sulphur. His hogs eat burnt charcoal as freely as they do corn. They are sheltered from the cold and storms by movable sheds. Occasionally, he dissolves copperas (sulphate of iron) in water, and mixes it with their food. This destroys internal worms and is also a tonic. Hogs are as subject to colds and pneumonia as human beings. The internal organs of the hog more closely resemble those of man than any other animal.

FEEDING GROUND FEED.—At a meeting of the Little Falls Farmers' Club, held on March 27th, this subject was discussed. Mr. Harris Lewis said that he had fed ground feed in the earlier years of his dairy experience, feeding all he had dared to, and of different kinds. Buckwheat produced the greatest flow of milk, at expense of flesh; corn meal never increased quantity or quality of milk, oat meal increased flow of milk and flesh of cows. Wheat shorts is best of all, but would prefer oats if cost was not so great. He thought that Mr. L. W. Miller, of Chautauque County, would fail in his experiment of wintering cows on three quarts of corn meal each without other feed. He thinks that it does not pay to feed meal to cows when they can get good pasture. N. A. Willard thought that when hay is as high as at present, it pays to feed corn meal; also when pastures are short. He also advocated sowing corn for fodder, which Mr. Lewis thinks is almost worthless. Sweet corn is best for this purpose, in the opinion of several members of the Club. Mr. Lewis thought high feeding tended to produce disease, but Mr. Brown said that the dairy cows in England are healthy, and much higher fed than here. Mr. Josiah Shull fattened a cow this last winter, and as he increased the meal, the flow of milk fell off. Her value November 1st was \$15; cost of feed till April 1st, \$46 50. She has given 1,266 lbs. of milk, which at 12 cents is worth \$15 82, and she was sold April 1st at \$70. If manure pays for care, the profits were \$24 32. — *Country Gentleman.*

Poultry Yard.

Poultry Notes—No. 10.

Rearing Ducks.

No farmer or fancier ought to be without a few ducks in his poultry yard; their appetite is such that almost any kind of food will supply them; they pick up the waste food left by other fowls, and grow fat upon it. In the barnyards, in gardens, and in pastures, they are alike useful and beneficial. In China, the raising of ducks by artificial hatching is carried on to a very great extent; establishments for such purposes are erected, and the business reduced to a regular system, giving employment to a large number of hands. In the garden or the vineyard young ducks are of great benefit as insect destroyers; it is truly wonderful with what diligence they dart after all kinds of bugs, thrips, flies and snails. As layers they are also very useful, laying a great many eggs, and as a table fowl, a young duck is hard to be surpassed.

Among poultry breeders there are three varieties of ducks, each of which stands high, although a number of other varieties are still bred and have their admirers as well as their good qualities to recommend them. The three best known varieties are the Aylesbury, which is a pure white; the Rouen, which in color resembles the wild Mallard, and indeed may be said to be his exact counterpart; and the Cayuga, which is a pure black, with occasional white feathers on the breast. The Aylesbury commences laying early in the season, earlier than the Rouens, but the Rouens (a French breed) are more precocious birds, arriving at maturity at the age of three months. The Rouen, too, is a hardier duck than the Aylesbury, and would thrive where the Aylesbury would die, and is a good layer of green colored eggs. It is said that a cross between the Rouen and Aylesbury is much esteemed; but as we have never seen any, we cannot speak of our own knowledge. It does no doubt tend to make the Aylesbury hardier, but does not increase their laying capabilities, although it may tend to make the flesh juicier. Three ducks are sufficient to one drake; and as soon as they have laid a setting of eggs, they should be placed under a hen and hatched. It is of great importance to have ducks early, which can only be procured in this way. Ducks seldom sit; but if they show signs of incubation, they ought to be allowed to persist in their desire. From twelve to fifteen eggs are not too many to let a duck have, and if possible persuade her to sit in a place of your own choosing—by the way, a very difficult thing to do; but in whatever place she persists in sitting, she ought not to be disturbed by any other fowls. She will very soon learn to leave her nest only when necessary; and to enable her to do so, the door of her house, or in a duck-house, should be left open for her return after her usual bath and food-taking, then closing it again to keep out the other fowls. When about to leave she will cover her eggs carefully, and never absent herself beyond the time necessary. The time of incubation is twenty-eight days, and during the hatching out of the ducklings she ought not to be disturbed, neither should she be shut up afterwards; for if deprived of liberty, she will most assuredly destroy the young ducklings. If hatched under a hen, of course the treatment will be but little different from that of chickens during the time of hatching; and it may be well to mention here that it is much better, if circumstances permit, to hatch several broods in the early part of the season, otherwise, if but few old ducks are kept, many young ones cannot be raised. The use of an egg tester in hatching duck eggs is very obvious; after a few days all the sterile eggs can be rejected, and by this means a great saving of hens' time made. After the ducklings are all hatched,

they ought not to be disturbed for twenty-four hours, after which they will be ready for food. A little hard boiled egg minced and mixed with oatmeal will be very suitable food. After a few days they may have oatmeal mixed with milk, rice boiled on milk and mixed with oatmeal, with wheat screenings or such other kind of grain most readily obtainable. Ducklings ought to be kept dry and not permitted to have access to water excepting to drink, as it will be fatal to them to get thoroughly wet. This may seem strange to a large number of persons, when they consider that water is their natural element; nevertheless, it is true that ducklings should never be allowed to swim in a pond or other place until they have put off their downy, and put on their natural feathering. It may be occasionally noticed, during a heavy shower of rain in warm weather, that all of a sudden young ducks stand still, get quite rigid and stiff, turn their beak upwards and tumble clean over, usually with a crook in their neck, and if not found at once and proper remedies applied, frequently never recover. A nearly similar catastrophe overtakes them if allowed into a large pan of drinking water, so frequently placed in their yard or pen by breeders, more especially if the water is cold. You leave them apparently all quite well and enjoying themselves in the highest degree, swimming about, and diving as none but ducks can do, and as nimble as bees; after a few minutes' absence you return to find one stretched here and another there, all apparently lifeless, and as previously described. This is cramp, occasioned by allowing them to have too free access to water before being duly feathered. The best remedy we know for this disease is to place the duckling in flannel near a stove, and give it ten drops of spirits—gin is said to be best—diluted with five drops of water; this must be repeated two or three times at intervals of half an hour, when in all probability a perfect cure will be effected. Prevention is, however, better than cure. The utmost extent of indulgence that should be allowed young ducks in water, beyond the quantity required for drinking, is occasionally on a warm day to allow them a shallow dish with a little tepid water to wash in. In case of wet or showery weather they should be securely shut into a dry shed or other similar place.

If ducks are kept in the same yard with fowls there is always difficulty in feeding each separately, a thing very much to be desired. Some time since there appeared in the *American Agriculturist* a simple but very ingenious contrivance for feeding ducks, and at the same time not allowing chickens to share their food. The food for the ducks is placed in a square dust-pan in which a few bricks are laid, filling the middle of the pan to prevent the food being shoved beyond their reach, then a box is turned over the pan and contents, and supported upon a brick under each corner. After a little experience the ducks learn to run their flexible necks under the box and fill themselves while the disconsolate hens can get nothing. Fed in this way ducks increase rapidly in weight. In turn the chickens have to be fed, and the plan adopted is equally ingenious as the other. On two barrels or wooden horses lay a board or two, and on this the food; the chickens fly up and take their meal, while the ducks stand looking on, unable to reach the much desired prize. Of the Rouen duck Mr. Hewitt writes: "I am confident that the Rouens are the most profitable of all the duck tribe; they are more lethargic, and consequently more speedily fattened than any others; they lay great numbers of large eggs of a blue green color, the shell being much thicker than in the eggs of the Aylesbury breed. The flesh is of the highest possible flavor, and in first-rate specimens is abundant in quality. I have frequently known young ducks, of only nine or ten weeks old, to weigh when killed twelve pounds the pair, and in some instances even more than this." When desirable to fatten young ducks for market, it is a good plan to shut them up in a small house, and feed on oats, bran or oatmeal placed in a shallow vessel of about one-half to two inches deep; with a little gravel mixed in the bottom they will lay on flesh very rapidly. But in a subsequent paper we will treat this subject more fully.

The Muscovy or Musk Duck.

The appellation of Musk or Muscovy is applied to this duck, because it is thought its plumage emits the odor of musk. It is a native of the warmer regions of South America, and is found in the numerous groups of islands which stud the Pacific Ocean; it is also found in Brazil, hence it is sometimes called the Brazilian Duck. They are of various colors, but commonly of black and white; they are also of clear white. The American standard of excellence does not recognise this breed, although mentioned by several of their poultry writers and bred by them. Bewent considers the black the handsomest variety, the most productive, and the one that yields the finest flavored flesh; the black are glossed with green on the back, and changeable as they are exposed to the sun. In the domestic state, says the same authority, it exhibits every variety of color like the common duck. At one time the male is white; in other instances, both male and female are of a lead color, yellowish, with more or less white. A crest, elevated or depressed at pleasure, rises from the back of the neck, and a scarlet fleshy space surrounds the eye, continued from scarlet caruncles at the base of the bill. The colors of the legs and feet vary with that of the plumage, being mottled in dull flesh color and black, according to the tints of the latter. The figure is of an extremely elongated character, and the shortness of their legs increase their stumpy appearance. It is not fond of water and will seldom go near a pond. The voice of the drake is very harsh and croaking, and the female is comparatively silent. As layers they are inferior to the Aylesbury or Rouen; the eggs are of a dull white, and small in proportion to the size of the bird. Some assert that they lay two or three times a year; the period of incubation is about five weeks. The male pairs readily with the domestic duck, and the produce is of large size, but the hybrid, it is said, is unprolific. The female will also pair with the common drake, and the hybrid thus produced has a deep green plumage, and is destitute of the red caruncled membrane on the cheeks, as well as the musky odor of the rump gland of the musk duck. The drake is very pugnacious, cross and quarrelsome with other poultry; he frequently attacks small children, manifests but little affection to his female partner, and none towards the offspring. Though a voracious feeder and a prolific breeder, it is easily fattened, but is not looked upon as a profitable bird for the poultry-yard. Mr. Wright makes the following remarks in his Poultry Book in reference to this breed:—

"THE MUSCOVY OR MUSK DUCK seems to be a comparatively distinct species, as the progeny of a cross between them and the more common kinds is found decidedly infertile, at least when bred *inter se*, though we believe they have been bred with the parent strains. The distinct *habitat* of the wild species is also in favor of this view; for whilst the Mallard extends through the northern regions, including both America and Europe, and probably even Asia, the Musk Duck is found wild only in the warmer regions of South America. Its district ranges from Guiana to Paraguay, but it does not migrate, which is another strong argument in favor of its distinct origin. In Brazil it is extensively domesticated, and is indeed the duck of the country; and it is also domesticated throughout both England and great part of Europe, particularly in Germany. The name is derived from an odor of musk which pervades the skin, but which is not present in the flesh when cooked; and Muscovy is obviously only a corruption of this term. The Wild Musk Duck is stated by all travellers to be a very active bird, even flying to the trees when alarmed, and passing the night in the same situation, perching upon the branches, which again marks a very wide distinction between *Cairina Moscha* and *Anas Boschas*. The nest too is sometimes built in the branches, sometimes in a

hollow near the water. Some observers have stated that they rear two broods, one in May and one in September, but this is uncertain. Before pairing the males fight desperately, during which they make the feathers fly to such an extent as to cover the ground at the scene of combat, and this quarrelsome disposition is strongly inherited by the domestic race. The general color of the Musk Duck is black and white, not variegated, but in large patches; but we have also seen pure white, pure black, and a kind of blue dun. The feathers seem very loose, looking as if half had moulted and the rest were just ready to drop out; but the most peculiar and distinctive characteristics are about the head, the cheeks being naked, with a scarlet fleshy space round the eye and the base of the bill carunculated also with scarlet. The head of the drake is very large, and these appearances are in him far more conspicuous, and give to him, in conjunction with a peculiar leer we have never seen in any other creature with feathers on, an aspect almost diabolical. The drake is very large, having been known to reach ten, eleven and even twelve pounds, and is destitute of the curled feathers common to other ducks—again marking distinctness of species—but the duck generally averages only about six pounds, and we never knew one over seven and a half pounds. This again is characteristic of the variety. The flesh of the Musk Duck is very good when eaten young, but it does not lay nearly so many eggs as the common kinds. They are also awkward to keep, the temper of the drake being simply abominable. He persecutes every creature he can manage, and has been known to attack children; as to other ducks, he is fond of seizing them by the neck and holding them under the water till they are drowned, if in any way they rise his dander. We recollect well an old rascal which belonged to a relative, and was kept in a yard with some dorkings. The first time the drake attacked him the dorking cock showed fight, but was quickly discomfited, and after that the drake made the poor fellow's life a positive burden to him. His favorite mode of offensive warfare was to rush at the poor dorking like a battering-ram and knock him clean off his legs, trampling over him as he fell; and we often wished in a half-hearted way for a good sharp fighting game cock to teach him a lesson or two. For these and other reasons the Musk Duck can hardly be called a profitable variety."

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CONTENTS OF THIS NUMBER.

THE FIELD: About Potatoes 181, How Plaster Acts 182, Deep Ploughing 182, How Soil Manures 182, Permanent Pasture vs. Arable Lands 182, Smut in Grain 182.

GRASSES AND FORAGE PLANTS: Hay-Making 183, Sowing or Drilling Corn for Fodder 183, A Pleasant Chat about Hay 183, Sowed Corn 183.

RURAL ARCHITECTURE: Designs for an Exhibition Building (III) 184, Barn Cellars 184, Culling Hoofs 185, Concrete or Gravel Wall 185.

IMPLEMENTS OF HUSBANDRY: Importance of Simplicity in the Construction of Implements 185, Machine vs Hand-Made Wheels 186, Tubular Harrows 186.

HORTICULTURE: THE ORCHARD: Codling Moth 186, Cutting and Packing Grafts 186, The Perforating Power of Root 189, Uses of the Cherry Tree 186, The Plum Curculio 187, Items 187. THE FRUIT GARDEN: Cranberry Culture 187, Water Melons 187, Blackberries 187, The Best Variety of Strawberry 187, The Elder 187. THE VEGETABLE GARDEN: Mushroom Spawn 188, Artichokes 188, To Pickle Green Cucumbers 188, Winter Cress 188, Keeping Celery 188, Growing Rhubarb 188, A New Pumpkin 188. THE FLOWER GARDEN: The Origin of Double Pelargoniums 188, Bouquet Making 189, The Aster (III) 189, The Daisy (III) 189, How to Grow the Oleander 189, Items 189.

VETERINARY: Structure and Diseases of the Horse's Eye 190, Fomentations 190, Pulsations per Minute 190, Hens 190.

CORRESPONDENCE: The Colorado Potato Beetle 191, Removing a Wart 191, Books on Farming 191.

EDITORIAL: Our Dairy Products 191, The Great Flood at the South 192, Canada Live Stock in the United States 192, Water Farming 192, A Good Farmer 192, English Short-horn Breeds 192, Cruelty to Animals 192, Items 192.

AGRICULTURAL INTELLIGENCE: The Fall Wheat Crop 193, Great Horse Fair at Belleville 193, Township of Vaughan Ploughing Match 194, Durability of Short-horn Sale 194, Sale of Mr. H. Herdington's Short-horns 194, Sale of Mr. Jefferson's Short-horns 194, Sale of Mr. Casswell's Short-horns 194, Sale of the "Forest Home" Herd 194, Short-horn Sale at Genesee 194, Sale of Mr. Senior's Devons 194, Items 194.

THE DAIRY: Making Good Butter 195, Creamery Plans and Practice (III) 195, Washing Butter 195, Experiments in Settling Milk 195, Does Feeding Turnips affect the Taste of Milk and Butter? 196, Straining Milk 196.

BREEDER AND GRAZIER: Comparative Feeding Properties of Green Fodder 197, Rules for Shearing 197, A Beautiful Incident 197, Profits of Out and Cooked Food over Uncut and Uncooked Food 197, Is Occasional Change of Pasture Desirable? 197, Buying a Short-horn Bull 196, Swine—Breeding Sevens at Will 193, Root Crop for Milch Cows 198.

THE POULTRY YARD: Poultry Notes No. 10 199, The Muscovy or Musk Duck 199.

ADVERTISEMENTS 200.

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