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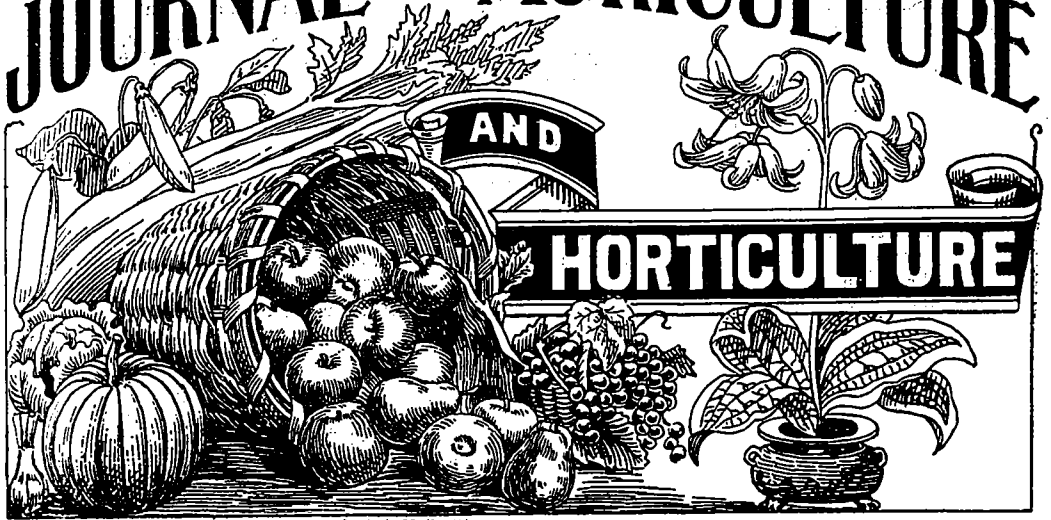
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THE JOURNAL OF AGRICULTURE



VOL. I. No. 10.

This Journal replaces the former "Journal of Agriculture," and is delivered free to all members of Farmers' Clubs.

MAY 15, 1898.

Notes by the Way.

Dairy-Shorthorns.—In spite of the opinion of several of our U. S. contemporaries, we still adhere firmly to our appreciation of the *dairy-shorthorn* as the best farmer's cow. We give below an engraving of the Champion of the London, Eng., dairy-show. She is not the least like any of the favourite patterns of the Editor of *Hoard's Dairyman*, and, according to the English farmer's ideas, so much the better. This cow of Mr. Spencer's gave 65 lbs. of milk in one day, from which 2 lbs. 9 oz. of butter was made. The three highest places in the *open class* for actual production all went to shorthorns and in the class for cross-breeds, two out of three were shorthorn-grades. Last year's winner was a shorthorn; in fact, barring "hukes," as the slang term goes, such as the championship being won by that excellent butcher's beast a polled Angus, shorthorns have beaten all-England three times out of four. If this year's champion is not the model of what a dairy-cow ought to be, we know nothing about it (the teats are badly represented in our cut); and would not she fat when done milking? (1)

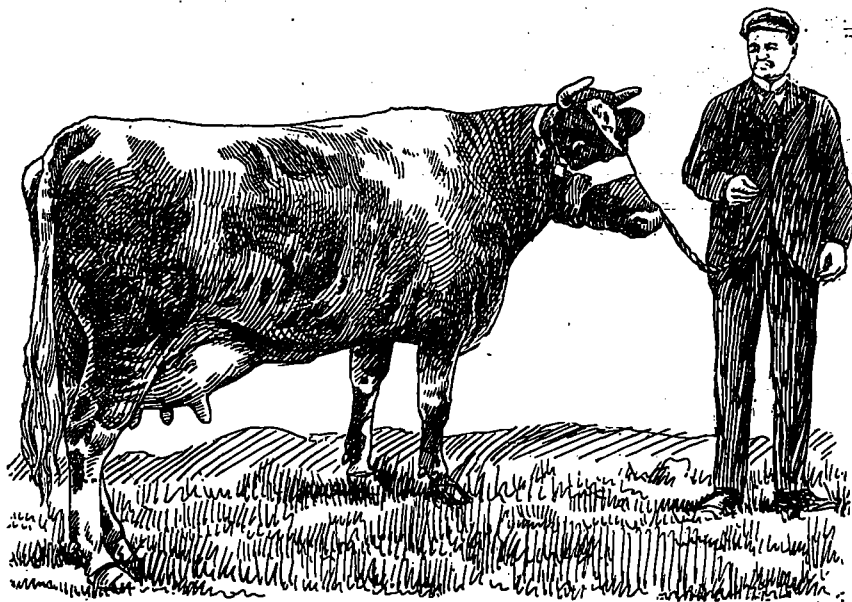
Dilatoriness.—A friend of ours travelled from Montreal to a place 100 miles beyond Ottawa, starting on Saturday, April 9th, and returning on Monday the 11th, and, to his great surprise, he did not see one plough or one harrow-team at work on the land during the whole time. Our friend is a Scotsman and accustomed to the land; so when he says the soil was in thoroughly good working order, he is speaking of matters that he understands.

We do not see whence this reluctance to early cultivation springs. Talking to a young farmer from Verdun, we asked him (April 17th) if he had got most of his grain in. "Oh! no," replied he, "it is too soon; only think if a lot of cold wind and rain should come!"

(1) Mr. James Cochrane tells me he is importing a herd of Dairy-Shorthorns of the best strains to be found in Britain. ED.

He then went on to say that they had finished harrowing a field the previous night (Saturday), intending to sow on Monday. "Ah!" said we, "a cold wind and rain on that harrowed field left unsown would do you much more damage than if it had been sown." "Well," replied our young friend, "we should have to plough it again, I suppose." "And that would be no trifling cause of delay in your spring work, would it?" There was no reply.

We remember M. J. Breux, of Chambly sowing pease on 1st of May morning. He got in about 2 acres, before breakfast; at 9 o'clock heavy rain set in, and not another bushel of grain or pulse was sown on that nasty blue clay at the Bassin de Chambly till the 10th June! The experiments tried at the Ottawa Farm should convince any one who is open to conviction that, take one year with another, early sowing is the safest and best plan to go upon. We have been nearly forty years in the country, and we have invariably observed that, as in England so here, the best and most successful farmers sowed their grain and pulse — especially pease — as soon as the land was fitted for the reception of the seed.



Shorthorn Cow Gaety: First and Champion London Dairy-Show, 1897.¹

Unfortunately, this practice of waiting for certain dates before sowing has, particularly in some districts, led to the too late sowing of some of the crops. How often do we see, in the more backward parts, oats sown between the 10th and 20th of June, and, which is worse, a stingy quantity of seed used even at that late period? Some of the experimenters return such small seedings that their trouble is quite thrown away. If 3 bushels of oats is enough for an imperial acre of land, in good heart, on the 1st of May, 4 bushels should be sown on the 1st of June, and even more if the land is in poor condition; though, in our opinion, at so late season, the piece should not be in oats or other grain, but in *mastin* of pease, oats, and tares to be cut green for the stock.

In support of what we have said, we quote the following, from Mr. Sanders Spencer, the celebrated breeder of Berkshires, promising that barley is about as delicate a grain, when just "braided," as can be found:

"Hunts (St. Ives District): March 31.—The weather during last week was of a

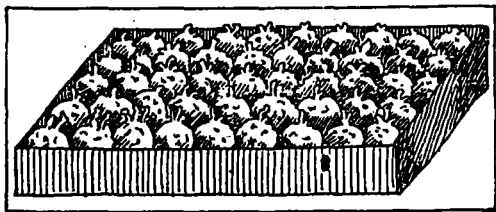
(2) Hunts, ie short for Huntingdon-Shire.

record-breaking character. Seldom, if ever, has been experienced such gales with snow, frost, rain, and hail for more than four days; and yet, after a few days of genial weather, but little ill effects are apparent.

"I have carefully examined my early-sown barley, and cannot discover that it has suffered in the slightest; indeed, I think I never saw it more promising; it is growing at a wonderful rate. I suppose that during the cold weather which followed *its being drilled in the middle of February*, that the plant was busy making root instead of so much growth upwards, and now that the moisture and the warmth have come there is nothing to hinder its rapid growth. The land could not possibly be in a better condition where it has been worked properly, but I regret to notice a much greater acreage of land which is not half cultivated. This spring there has been no possible excuse for this great neglect, at least so far as the season has been concerned; it could not possibly have been more favourable for the tillage farmer, scarcely a single day during the whole winter has the land been too wet or too hard for the ploughs to work."

Water cress.—"Water-cresses! Nice fresh water-cresses!" "This," says a correspondent of *The New-England Homestead*, "is one of the cries of the London streets." Well, all we can say is, that if the cry is "*Water-cresses*," nowadays, education has made vast strides since we lived in London: it used to be "*creuses*," just as no corkney ever spoke of "*shrimps*," but always left the *h* out: *s'rimsps*. But call them cresses or creases, as you will, they are capital good things and can be grown without much trouble wherever there is a small stream, preferably from a limestone source, as thus: Sow the seed, early, in a frame; transplant once in the open ground; when well rooted, make up balls of clay in each of which pack the roots of a plant, not too tightly, and set them in the stream near the side. It would be as well to place stones in the water in such a position as will lead away the main flow of the stream from the plants, to prevent washing.

We tried this simple plan at Lachine, in 1889, and found it answer admirably. A plantation of ten feet by one foot, requiring about a dozen plants, would supply a family with more than it can consume: unless a very numerous one. Our English cresses are grown on a large scale, and almost invariably in the Chalk district. Six to fourteen acres in a plot are no uncommon sizes. Of the kinds, the *bronze-leaf* is by far the most succulent.



Box of Sprouted Seed-Potatoes.

Early - potatoes.—We have often mentioned in this periodical a plan we have practised for many years when growing early potatoes. The engraving gives a good idea of the box and its packing of seed-tubers. It should be placed in a well lighted room, frost-proof of course, and started, in this district, about March 1st.

Irish crops in 1897.—Owing to its damp climate, very little wheat is grown in Ireland, oats being the favourite grain-crop. In 1897, the product of the wheat-crop in that country was 1,355,240 bushels, at the rate of 28½ 60 lb. bushels to the imperial acre. Oats yielded 16,264,733 cwt. (112 lbs.); barley, 2,587,137 cwt.; potatoes only 2.2 tons (88 bushels of 56 lbs each) an acre; turnips and mangels 14 tons; sown grasses gave of hay 2.3 tons; permanent meadow, 2.4 tons.

Winter-wheat in U. S.—The condition of this crop is more promising than it has been in April in any year since 1894. California gives the worst showing: only 62 oyo of a full crop; and Kansas the best: 101 oyo; though how a crop can be 1 oyo more than perfection we do not see!

Lucerne.—From Australia we hear that although the crop stands well through a single season of drought, after two or three such seasons even the subsoil fails to supply sufficient moisture. But, in spite of this, investigations made this year have shown that owners of lucerne pastures in that country have been able to keep thousands of live stock that must have perished had grass been their sole dependence. A single inch of rainfall start a lucerne plant growing. Here in Canada, our heavy snowfall ensures us against a desiccated subsoil.

Agricultural Imports.—During the three months ended March 31st, the imports of living animals for food amounted in value to £2,634,215, as compared with £2,319,300 in the corresponding period of 1897. The number of oxen imported was 139,526, against 122,249. Of these 110,789 against 100,958 last year, came from the United States; 23,358, against 16,756, from the Argentine Republic; 288, against 369, from Canada; and 5,091, against 4,166 from other countries. There were 182,069 sheep imported, against 137,826, of which 59,901, against 53,051, came from the United States; 116,338 against 82,189 from the Argentine Republic; 3,511, against 2,586, from Canada; and 2,319 from other countries. The number of pigs imported during the quarter was 188, none having arrived last year. The value of corn imported was £15,431,568 against £14,136,373 last year. Dead meat was imported of the value of £6,918,445, against £6,056,046 last year. The quantity of fresh beef imported was 673,323 cwt., against 639,342 cwt. last year, and of fresh mutton, 721,424 cwt., against 696,142 cwt. last year. The value of butter imported was £4,328,542, against £4,367,018; margarine, £616,324, against £668,316; cheese, £830,887, against £923,946; eggs, £887,503, against £943,273. The quantity of potatoes imported was 1,908,670 cwt., against 1,109,458 cwt. last year. Of condensed milk the value was £376,785, against £345,874.

Mangels.—As a rule, the few farmers that grow mangels in this province consume the crop too early in the feeding season. Mangels have properties that which give them a money value beyond that of ordinary roots. Their keeping properties render them highly suitable to late spring and early summer feeding. Our dear old farm-tutor, the late William Rigden, the Sussex ram-breeder, used to give almost any price for mangels in July, for his exhibition sheep. Wrightson, of Downton Agricultural College, Eng., says:

“It is during May, June, and July that a stock of mangel becomes most valuable upon a farm, and during summer it is almost as good as cake or corn for stock-feeding. If a fair crop of 30 to 40 tons per acre of mangel can be grown after roots fed, it is not unreasonable to assess its feeding or consuming value at 7s. 6d. to 10s. per ton. This, if a fair estimate, places it in a much higher position than even a good crop of wheat. The matter is well worth considering. I have in view the case of a good piece of kale now being fed off by sheep receiving cake and corn, and in a few weeks the same land will be carrying a promising crop of mangel. The value of this crop will, it is hoped, amount to a sum arrived at by multiplying the weight per acre in tons by a certain number representing the supposed feeding value of a ton of mangel in May or June. It is unnecessary to name either figure, for they lie in the dim future, controlled both by the weight of the crop and the then abundance or scarcity of keep.”

Why should not we here sometimes follow a potato crop with mangels. It would take less labour to work than after a grain-crop, and although the rotation would be broken, the extra dressing the land would receive for the mangels would well make up for the slight damage, and two grain-crops might be taken to square matters. A couple of hundred pounds of nitrate of soda, or its equivalent in sulphate of ammonia, say 140 lbs. an acre, should always be used for mangels, as it is clear, from hundreds of practical experiments, that mangels are, as the Scotch say, “avid” of nitrogen.

Beet-sugar in England.—A good deal of excitement in England about beet-sugar. The total failure of the great sugar-beet farm of Campbell of Buscot, on which 1,700 acres of beets were grown in one year (1865?) will probably deter the prudent men of England from entering into the speculation, particularly since wheat is likely to be high in

price for some time. After their severe trials of the last twenty years, the English farmer would rather rest quietly for a while, satisfied with earning his bread-and-cheese; in a few years he will get dainty again and be anxious to revert to '34 port and other dainties he used to enjoy about the Crimean war time. Then, very possibly, he may be in a humour for a "flutter."

Orchard and Garden.

(CONDUCTED BY MR. GEO. MOORE.)

SEASONABLE HINTS FOR SEED TIME AND EARLY SUMMER.

The size of the seed is a guide as to the depth it should be sown, the large ones as beans and peas may be covered with two or even four inches of soil; the small seeds must be sown nearly on the surface.

Be sure you have a good level, well pulverised seed bed.

Never sow on a very wet day.

If the land is very dry give it a soaking a day or two previous to sowing, waiting until the soil does not clog the tools used.

Sow all you can in drills; the advantages of drill sowing over broad-cast are that: less seed will be required, weeding and cultivating will be much more readily done, blank places can be filled up and the securing the crop will be easier to perform.

Some vegetables are better for being transplanted before they are transferred to their permanent places in the garden.

Transplanting should be done as soon as the plants will bear handling, say about two inches high. Showery or cloudy days or in the evening are the best times to transplant: cabbage, cauliflower, lettuce, celery, tomato, and asparagus may be transplanted, but carrots, turnips, beets and parsnips should not, except to fill up missing plants. (1) Kidney beans can also be transplanted, the largest onions can be grown by transplanting them when quite small, but it would not pay to transplant the general crop.

Rotation should be observed in a garden as well as on a farm. Generally speaking, crops whose roots go deep in the soil should be followed by those which occupy the surface or a little below it. Two crops of the same kind should not occupy the same spot two years in succession, except it may be onions. Cabbage or cauliflower should be succeeded by potatoes; parsnips or carrots may come next, then again potatoes. Or peas, beans, tomatoes, beets, or onions may be planted after potatoes.

A weed is a robber and cannot be tolerated, much less allowed to go to seed. The best time to destroy weeds is as soon as they appear.

The hoe is the most important tool in the gardener's hands, and its use should be prompt and constant, for with it not only can the seedling weeds be destroyed but the surface of the soil loosened to admit the free access of air and moisture, without which success in producing a crop is impossible.

Hot sunshine will not penetrate well hoed ground, and in a very dry seasons watering will not be as necessary as it would be if the ground was left unhoed.

Autumn cultivation, good manuring, and frequent loosening will usually overcome the necessity for watering even in very dry seasons. If watering must be done we must not wait until the plants flag and droop but give the ground a soaking with pond, or, if possible, rain water; or if pump or clear spring water has to be used it should stand some time previously, when it can be warmed and aerated. To sprinkle merely, or to use very hard, cold water is no good. Water used for seeds sown in a hot bed would be better for them if it were made the same temperature as the air in the frame.

Judgment, forethought and diligence, are indispensable qualities in a gardener.

(1) Swedes (a cabbage) transplant well; but we never but once saw the white-turnip take. E.D.

MEDICINAL PROPERTIES OF SOME HERBS AND GARDEN VEGETABLES.

The wholesomeness of vegetables is often adduced as a reason why every farmer should make the cultivation of a garden a part of this domestic economy.

There is a trite saying that as regards his own health, a man is a Fool or a Physician at forty. Doubtless if people would pay more attention to the most simple sanitary rules, as to diet, regularity, seasonable clothing, avoidance of undue, and often, unnecessary exposure, and would eat such vegetables as are known to prevent or relieve certain disarrangements of the system, indicated to each individual by symptoms, he would soon learn to understand, he would sustain his health and prolong his life.

Therefore it is hoped that a list of a few of the vegetables that can be easily grown, with a brief outline of their various medicinal and corrective qualities may act as an inducement to some "scoffers" to change their minds as to the profit to be derived from the "garden of the farm".

Asparagus—enlivens the blood, stimulates the action of the kidneys, relieves palpitation of the heart, and is good for rheumatism.

Beans—are highly nutritious and invigorating.

Beet—purifies the blood; acts as a good appetiser.

Cabbage—blood-purifier and mild purgative.

Capsicum—"Chili" or *Cayenne pepper*. Cure for habitual drunkenness. Efficacious in liniments; stimulating.

Carrots—Relieve liver complaints and gout, purify the blood and make good poultice for ulcerated sores.

Celery—very nutritious, and an excellent blood purifier, very advantageous in all nervous diseases also in rheumatism and neuralgia.

Cress—the cresses are excellent blood purifiers and useful in action of the liver and in scrofula.

Cucumbers—are cooling to the blood.

Dandelions—when boiled are good for the kidneys also.

Endive—good for torpid liver.

Horse-radish—stimulating, and good for scurvy.

Leeks, Onions—Garlic and Shallots stimulate the circulation of the blood and promote digestion.

Lettuce—the heart and young leaves are cooling, induce sleep, and soothe pain; the seed stem is poisonous.

Melons—cooling, refreshing, and a mild aperient.

Parsley—acts with good effect upon the kidney and bladder.

Parsnip—very full of nutrition.

Peas—not medicinal but very nutritious.

Rhubarb—refreshing and good for the stomach.

Spinach—good in ailments of the kidneys.

Tomato—a stimulant to the action of the liver.

Camomile—"Tea" good for stomach complaints.

Horehound—for coughs and colds.

Rue—good to lessen fever.

Wormwood—(absinth), an excellent appetiser.

CURIOUS FACTS.

Japan has made mushroom-raising quite a profitable industry. They are raised from oak logs. The logs are cut into lengths and the bark beaten or cut with axes, they are then left in the forest to decay and from these the mushrooms spring.

They are then gathered and dried, either in the sun or by artificial heat, in which state they are exported. In 1895, 1,780,597 lbs. were shipped.—(*Scientific American*.)

Black rot, the dangerous enemy of grapes has been treated successfully by sprinkling the fruit with calcium carbide.—(*Revue Industrielle.*)

One of the oak trees in Windsor Park is supposed to be 1200 years old ; it is known as " William the Conqueror. "

The seeds of *Orchis maculata* are so minute that it takes 15,000 to weigh a grain.

TREE PLANTING.

(By HENRY ABBEY.)

What do we plant when we plant the tree ?
 What do we plant when we plant the tree ?
 We plant the ship which will cross the sea,
 We plant the masts to carry the sails,
 We plant the plank to withstand the gales,
 The keel, the keelson and beam and knee—
 We plant the ship when we plant the tree.

What do we plant when we plant the tree ?
 We plant the house for you and me,
 We plant the rafters, the shingles, the floors ;
 We plant the studding, the laths, the doors,
 The beams, the sidings, all parts that be—
 We plant the house when we plant the tree.

What do we plant when we plant the tree ?
 A thousand things that we daily see.
 We plant the spire that out-towers the crag,
 We plant the staff for our country's flag,
 We plant the shade from the hot sun free—
 We plant all these when we plant the tree.

North-West Farmer.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST.)

Unlined Blouses or Shirts.

Unlined shirts should be cut in three parts, the back entire, with two front pieces, and the sleeves of the modified Bishop style, having only one seam. To cut a shirt of this pattern you must have three yards of twenty-seven inch material, such as grass lawn or the pretty printed cambrics and zephyrs ; and if you want frillings of the same materials it will take more, say three-and-a-half to four yards. There are various ways of cutting the ornamental frills now so much worn. For instance, should you decide on a pleated frill, cut your material for it lengthways, that it down the selvedge. Gathered frills, on the contrary sit better across the material, and should be finished with a tiny hem machine-stitched. Suppose you wish a frill placed below tucks, gather the frill on a fine piping cord. There is just a little wrinkle I would mention here, always shrink your piping cord by soaking it some time in warm water, and then hanging it to dry. Piping cord has a most uncomfortable habit of shrinking in the wash tub, and so gathering up the material on to which it is stitched as to destroy the beauty of your work.

Bishop sleeves are this year smaller and closer, and in many the cuffs are trimmed. The turned down linen collar and cuffs are not considered quite so smart, although I have no doubt they will be largely worn this year.

A Little Girl's Dress.



The young Lady of the sketch was to have appeared as "The Queen of May;" but having failed to be in time for that, she now comes to help to inaugurate the new dress or type of this *Journal*, while is supposed to appear with this number, and which will naturally be black, thereby shewing off her's all the better, which is white.

The dress looks rather airy for this time of year, and this one is decidedly for the summer time, which will very soon be here.

Now, let us see what the young lady has on.

She starts with a combination suit of flannel.

Then comes the little stays (no bones) or waist, to which is buttoned the drawers, a skirt with a loose fitting waist, so as to give perfect freedom to the body (never give a child of this age bands to her skirts; they slip about, and are a source of annoyance to her every movement.)

This little girl has on a cream coloured skirt, made quite loose; a box plait under the armhole to assist in keeping a little of the fulness there; shoulder seams; finish off with a collar, or gather the silk round the top to form one.

Small bishop-sleeves, gathered round the wrist.

Be sure to give plenty of freedom in the armhole.

Now comes the dress of white muslin, a perfectly loose-fitting garment, cut out a little, with the same plait under

the arms, which must be bound round to make it strong.

The frills of white muslin form the supports for the shoulders, finished off with bands of pink ribbon, a bow and long streamers nearly to the bottom of the skirt.

A broad hem, and as many bands of baby ribbon as your patience will let you put on; only two are given here but to be *very* fashionable you must have many.

A Leghorn hat trimmed with flowers and a very little ribbon; the hat tilted a little on the left side, where there is a small bow of ribbon.

For a small child, strings should be given, as the Leghorn hat is apt to flop about. It has always been a favourite for young children, as it is pliable and not easily torn, and will certainly last for two or three seasons.

Home Dressmaking.

Bodices chosen for young people are mainly of the blouse order, and belts and bands are so much in favour that in all probability they will remain fashionable all through the

summer. The trimmings for such bodices may be either pipings, strappings, appliques of lace, and, of course, the inevitable tacking, but prettiest of all for young people's wear are the tiny frillings of ribbon which look so soft and dainty. Many of the blouses bodices of the season have quite plain backs, cut without side pieces and very often without any back seam showing. With these tight-fitting backs and still worn the full and excessively bagged fronts, which droop so much that they quite hide the handsome clasps and slides of the belt. Of course, it will not do to hide these, so they often figure at the back of the bodice instead of the front, as is the usual fashion with belts and clasps.

Lemon Marmalade.

For this delicacy you must choose good sound fruit. Carefully examine the skins to see that they are fresh and clear. Place them in a saucepan with water enough to cover, and boil for two hours, or till they are perfectly tender, changing the water several times, being careful always to use boiling water to fill up with. Now slice the lemons thinly, refusing only the pips, and to every pound of pulp use two pounds of cane sugar and one pint of the last water in which the lemons were boiled. Boil the water and sugar together for thirty or forty minutes, then add the lemon pulp, and boil till it jellies. Then put into jars. Some people reduce the quantity of sugar, and if this is done longer boiling will be necessary before it jellies.

Fig Pudding.

Fig pudding is a dish not to be despised. There are several ways of making it, but this one is about the best. Chop very finely about half a pound of suet, and the same quantity of figs; then mix them with half-a-pound of finely-grated breadcrumbs, with a little castor sugar and enough golden syrup to make a nice paste. Butter a mould, fill it with the mixture, and boil or steam it for one-and-a-half hours. Turn it out, and serve either plain or with whipped cream or treacle sauce. The latter is made by flavouring a little white sauce with some lemon rind and a spoonful of golden syrup.

To Keep Cured Hams.

This recipe is for keeping hams after they are pickled or smoked. Let them remain in pickle till the weather is warm enough so they won't freeze, then take out of pickle, drain, wipe dry, rub all over as much as will stay on with powdered borax, and be sure and fill in where the string goes. A lady a few days ago gave me a piece of boiled pickled ham that was taken out of pickle last April, had hung in a shed all the summer, and was as sweet as if newly pickled.

The Breeder and Grazer.

BREEDING.

Art of Breeding - In and in breeding - Reversion - Prepotency Selection - Pure bred stock - Breeder's conclusions.

The art of breeding is based upon principles which are not difficult to grasp. It is true to a certain degree, that "like begets like," so that whatever peculiarities the sire and dam may possess are reasonably to be looked for in their offspring. The breeder should therefore exercise his skill in mating together two animals who possess those qualities which he wishes to concentrate in their progeny. The perfection of any particular breed of animals is most nearly arrived at by "in and in breeding"—that is, mating two animals nearly related or at least belonging to the same strain. But when this is carried out to too great an extent,

it has many drawbacks. For instance; many hereditary diseases, loss of reproductive power, and general delicacy, are induced. Pigs show the bad effects of such breeding sooner than any other farm animals. Darwin thought that this was because of their comparatively solitary habits.

Shorthorn cattle are not so much the worse for in-breeding as most other stock. Their distinctive type has been stamped upon them by judicious in-breeding. This stamping of family characters or types by "in and in breeding," is its only advantage and cannot be avoided in the formation of new breeds or the improvement of old ones.

The force of inheritance is strongest in old and well established pure breeds, but even among the best an inferior animal may appear at times. The greater the extent to which animals are pure-bred that is, have been bred true to a given type for a long time, the more fixed or permanent are their points or peculiarities, and the more capable are they of transmitting them unimpaired to their offspring. Offspring frequently resemble in features, disposition or otherwise, their ancestors of generations back.

The offspring of a pair of polled cattle may, for example, develop horns. Such is a case of "atavism" or "throwing back." (1)

The longer a breed has been preserved pure, the more likely are its individual members to faithfully transmit their characteristics. This prepotency is commonly made use of to impart to under bred stock characteristics which are not inherent in them. For example, advice is often given to use a pure bred bull of desirable qualities amongst a herd of non-descript dairy cows, as a result of which the heifer calves are likely to grow into cows superior to their mothers. More especially will this be the case if the bull himself comes of a good dairy stock, and is the offspring of a first class dairy cow.

In the improvement of stock, of all kinds the breeder should exercise his powers of selection both on the male and on the female side. But there is a reason for special trouble being taken in the selection of the sire. This is, that the sire is usually the parent of many offspring, whilst the dam in the case of the mare, the cow, and the ewe—only gives birth to one or two young in the course of a year. A breeder often begins operations with a very indifferent herd of cattle, or a decidedly inferior flock of sheep. But by the use of pure bred sires the prepotency of the latter has its effect, and the offspring will probably resemble the sires rather than the dams. Pure bred sires are again mated with the female offspring, and by the continuation of this course for some years, it is possible to so improve the flock or herd that at length it comes to be recognised as "pure bred."

The advantages of pure bred stock are many. In the first place it costs practically no more, sometimes less, to rear a pure bred animal, than one that is not pure bred.

In the next place, if it is a butcher's animal, there will be far less offal about it and more substance in the useful parts of the carcass, if it is pure bred.

We must not suppose that any pure bred animal will make a desirable parent just because it is pure bred.

Besides this it should be sound and healthy. The breeder should aim at the development of qualities that are useful rather than at those which are merely fanciful.

The following conclusions have been arrived at by breeders:

1. Man has the power of controlling and modifying the forms of all animals.
2. Such modified forms can be handed down to the progeny; but, being departures from the primitive or natural type, this form can only be maintained by "artificial selection."
3. It is best to seek for improvement through the male, both on account of his own special endowments, and also because one male can serve many females.
4. Qualities of form and character become hereditary in proportion to the frequency of repetition in past generations, but high pedigree will not make up for important defects.
5. Animals closely related may be paired, provided they are healthy, well formed, without hereditary taint, and that the practice be continued through only two or three generations.

(1) Atavus.—a gt.—gt.—gt.—gt.—grand-father. Ed.

6. Young females should be put to the best of their own kind at the first impregnation, to avoid reappearance of stain in future progeny.

7. Science has not revealed any rule by which the proportion of the sexes can be predetermined and secured. (1)

8. The sire exercises most influence on the size, muscular power, and general conformation of, while the dam influences the nervous system and constitution of, and is more likely to impart hereditary diseases or weakness to, the offspring.

WALTER S. G. BUNBURY, Compton Model-Farm.

CROSS-BRED ANIMALS.

The most noticeable feature in modern stock-breeding is the success that has attended the raising of cross-bred animals for the block. Cross-bred cattle and sheep have been common since the various breeds have been established. But there are cross-breds and cross-breds.

The animals that went by that name of old were the result of chance or negligence, mainly the latter. These we have still with us, and are likely to have them as long as there are ignorant and careless breeders of stock in the land. The cross-bred cattle and sheep that have come so much into favour are no chance animals nor are they the product of a careless selection by the breeders.

It is no exaggeration to say that it requires quite as much skill to raise the highest class of cross-breds as it does to raise pure bred stock. This is shown by the fact that the range of prices is very great in cross-bred stock.

What I may term the "scrubber" is often of no actual value, while for the carefully bred cross-bred, whose parents were the best of their kind, there are always plenty of buyers at full rates.

The value of cross-breeding judiciously carried out is shown more clearly in sheep breeding than it is in cattle raising, particularly where the object of the farmer is to raise sheep for the market. It is often urged against the cross-bred that it has no type; that the results are uncertain, and if the system be persevered with for several generations, it will infallibly end in disappointment. I am the strongest of advocates for purity of blood, and for the maintenance of stud flocks and herds, and yet I believe that cross-breeding can be maintained for any number of generations, and the stock kept at a high standard of excellence, to the financial benefit of the owner. It must not be understood from this that I advocate general cross-breeding in flocks. The circumstances of the locality and the object the flock master has in view must be the guide as to what sheep are to be raised. There is naturally a greater oscillation of type in the cross-bred flock than in one of pure race, but a skilful breeder who closely attends to his business, can reduce these oscillations to within a very narrow margin. When unskilful flock-masters undertake to raise cross-bred sheep, particularly when the long-wool is crossed on the merino, the oscillations are so great that the sheep may be fairly said to have no type at all. To remedy this defect it has been suggested that an intermediate variety between the long wool and the merino should be established. This project has been talked of for years and years, and many attempts have been made to produce the desired variety. In the past these attempts have failed, but there are still sheepbreeders engaged in the apparently hopeless task. I have seen in Australia one of the best of the intermediate flocks, that has been bred within itself for several generations, but the animals do not come up to those cross-breds raised by a skilful breeder in the usual way.

Perhaps the best cross-bred flock in the world is that owned by Sir Rupert Clarke, Victoria, Australia, and founded more than sixty years ago. The cross is long-wool and merino. The wool from this flock realises a high price, the sheep yield a good weight of wool, the fat stock command the highest rates in the market. The sheep in both the breeding

(1) Though a good many quacks are now advertising their *nostra* for that purpose. Ee.

and the stud flocks are carefully culled, and the tendency of the sheep to vary is closely watched, so as to prevent the type swaying too far to the one side or the other.

Cross-breeding for raising lambs for market is a profitable business, where the sheep farmer realises for what type of sheep his country is adapted. Here the Downs come in most advantageously, and there is great variety in the crossing with them.

In Britain there is a great diversity in the crossbreeding of sheep. Besides the breeds already named, the black-faced Highland sheep is making its way southward. The Cheviot ewe is much fancied for crossbreeding particularly for raising lambs. Notwithstanding the amount of crossbreeding that is being done, the established breeds are being maintained with greater care than ever, and this care is manifested by the existence of flock-books for all the leading varieties of British sheep.

W. R. GILBERT.

The Dairy.

PASTEURIZATION AND STERILIZATION OF MILK.

It does not seem to be generally known that but a comparatively low temperature is required for the destruction of the more important kinds of pathogenic germs, but it is nevertheless a fact, and is of great importance in treating milk which is contaminated with this type of germ.

Germs of this type such as those causing tuberculosis, typhus, and cholera, form no lasting spores, and succumb therefore to very low temperatures. Of course the life of bacteria is to a great extent dependent on temperature. Every bacterium has a maximum and a minimum, and also an optimum degree of temperature at which it flourishes, and further, a point below or above which, it dies. The influence of cold, especially repeated freezing and thawing, is able to destroy many kinds of bacteria. The temperature above which death ensues, lies, for the vegetative cells of the majority of bacteria, between 125° F. and 150° F., while their spores are able to withstand a much higher temperature. Most spores are capable of germination even after being subjected, for a short time, in liquids to a temperature of 212° F., and many resist for a comparatively short time a dry heat far beyond this.

It will be seen, therefore, that the vegetative cells of many germs can be destroyed by a continuous heating for fifteen or twenty minutes at a temperature of 165° F. This treatment is known as Pasteurizing.

It will be seen, further, that milk can be obtained and preserved comparatively free from germs causing tuberculosis etc., simply by bringing it to as low a temperature as possible, immediately on its being drawn from the cow, and by maintaining this low temperature until made use of.

Neither this latter treatment or Pasteurization, however, will prolong the keeping qualities of the milk beyond a limited time. This can only be insured by a comparatively high temperature, which alone has been found to effectually destroy the spores of many kinds of saprophytic bacteria, which impair to a very large extent the keeping qualities of milk. This treatment may be simple or intermittent sterilization.

Milk is sterilized in the full sense of the term only when it has been rendered entirely free from germ life by sufficient heating, that is to say, when all the lower forms of life, which it contains, vegetative forms as well as lasting forms, are entirely killed, and any enzymes formed by bacteria are destroyed.

Perfect sterilization can only be effected by submitting the milk to the action of continuous heating for two hours at a temperature of 250° F., or when it is submitted to intermittent heating at different high temperatures. The latter method of treatment, so-called intermittent sterilization, avoids the heating of milk at temperatures over 212° F., and consists in heating the milk two hours at a time at a temperature of from 160° F to 165° F., then keeping it for several days at a temperature most suitable for germ development, about 100°

F., in order to let the spores which are left behind germinate and form vegetative cells, then in order to destroy these to submit the milk again for two hours to a temperature of 160° to 165° F., then again to allow the milk to stand for several days at the same favorable temperature for germ development, 100° F., and so on. These consecutive changes of temperature may be repeated five times, one after the other, and at last the milk is brought to a temperature of 212° F.

The properties of the milk, however, under the above treatment undergo considerable change. The fine condition of division of the butter fat is somewhat altered. A number of the fat globules of the milk come together, and after a time there collects on the surface a cream which resembles butter, and which can no longer be uniformly broken up. This, unfortunately, is such an inconvenient method, and takes up so much time besides being very expensive, that it is not well suited for general application. However I am informed it is to be given a trial in this country, before very long, and if found to be practicable, should prove a remunerative investment, by providing pure milk suitable for export to tropical, countries, where at present milk is only used in the condensed form.

April 1898.

H. WESTON PARRY.

Butter

Butter consists of the following Tri-Glycerides :

Fats.	Symbols	Melting Points.	Group.	Corresponding Fatty Acids.	Symbols	Melting Points.	Group.
Butyric	C ₁₅ H ₂₆ O ₆	0C	Liquid Fats (Oil)	Butyric	C ₄ H ₈ O ₂	0	Volatile Fatty Acids
Caproic	C ₂₁ H ₃₈ O ₆	—		Caproic	C ₆ H ₁₂ O ₂	2	
Caprylic	C ₂₇ H ₅₀ O ₆	—		Caprylic	C ₈ H ₁₆ O ₂	16	
Rutic	C ₃₃ H ₆₂ O ₆	—		Rutic	C ₁₀ H ₂₀ O ₂	30	Real Fatty Acids
Oleic	C ₅₇ H ₁₀₄ O ₆	0		Oleic	C ₁₈ H ₃₄ O ₂	4.4	
Myristic	C ₄₅ H ₈₆ O ₆	—	Solid Fats	Myristic	C ₁₄ H ₂₈ O ₂	53.8	Acids
Palmitic	C ₅₁ H ₉₈ O ₆	45.5-62.7		Palmitic	C ₁₆ H ₃₂ O ₂	62.2	
Stearic	C ₅₇ H ₁₁₀ O ₆	52-69		Stearic	C ₁₈ H ₃₆ O ₂	69.2	
Butic	C ₆₃ H ₁₂₂ O ₆	—		Butic	C ₂₀ H ₄₀ O ₂	75	

ANALYSES OF BUTTERS.

Comparison of the Percentage Composition of Real and Artificial Butter.

	Fresh Butter Unwashed	Fresh Butter Washed.	Salt Butter 4oz to 1 lb	Butter Milk.	Constituents.	Butter	
						Real	Artificial
Water	10.0	11.3	12.0	90.0	Palmitin	20.33	22.32
Butter Fats....	87.8	87.2	82.5	1.0	Stearin	42.77	46.94
Albuminsids...	1.0	0.5	1.0	3.0	Olein	27.71	30.42
Neilla Sugar...	0.3	0.2	0.3	5.5	Butyric.....	9.19	0.32
Asb	0.9	0.8	4.2	0.5	Caproin.....		
	100.0	100.0	100.0	100.0	Caprillin.....		
					Rutin or Caprin...		
					Butin or Arachidin		
					Myristin.....	100.00	100.00

The aroma and flavour of butter are due to the presence of the six last, (Butyric, Caproin, Caprillin, Rutin, Butin and Myristin) probably to their incipient decomposition: while rancidity is excess of decomposition, butyric and formic acids being among the principal products, giving bad taste and odour.

This decomposition is hastened on by the presence of casein acting as food to the butyric and other bacilli, so that butter which has been washed in the granular stage to remove the casein keeps longer and never becomes so rank in flavour as the unwashed. Six per cent of the fatty acids, which are set free in decomposition from the glycerin with which they are combined, are soluble in water, and thus rancidity may be partly removed by reducing the butter to small particles and washing it again. The fatty acids can also be distilled off.

COMPARISON OF BUTTER WITH MARGARINE.

	Butter	Margarine
Melting Point.....	29-35°C	34-40°C
Solidifying Point.....	20-30°C	18-38°C
Specific gravity at 60 °F.....	.926-.929	.915
“ “ “ 100 °F.....	.911 and over	.903-.906
Per cent of Fatty acids soluble.....	5-7	1-2

Butter fat exists as tiny drops or globules suspended in the serum of the milk, this serum being a solution of saccharine and albuminous substances. (It is a debated point whether the butter globules are enclosed inside a skin of casein or not). One pound of milk yielding 4 per cent must contain 40,000,000,000 of them. The largest fat globules in cream are .0005 to .0006 in. in diameter and the smallest $\frac{1}{10}$ of this. The size diminishes from the time of calving. The size varies according to the breed of the cow. For instance the Jersey cream globules are .00019 in. in diameter, and the Ayrshire cream globules are .00014 in. in diameter on an average.

Large globules can be most easily churned.

Size of globule	can be churned in
.000225 in.	13 minutes
.00019 “	30 minutes
.00018 “	34 minutes

Large globules, then, are therefore best for butter making (as Jersey) and the smaller one for cheese (as Ayrshire) the larger ones also rise more readily into cream; the smaller ones never rise, and thus make an even and rich cheese.

AVERAGE BUTTER YIELD FROM SWEET AND SOUR CREAM.

	Sweet	Sour
Minutes churning	32.00	29.00
Butter per 100 lbs cream lbs	14.38	17.11
Per cent gain	—	18.98

COMPARISON WITH CREAM ARTIFICIALLY SOURED WITH .25 PER CENT OF LACTIC ACID (4 C₃ H₆ O₃)

	Sweet	Acidified	Sour
Minutes churning	35	40.00	32.00
Butter per 100 lbs	14.85	17.19	13.64
Per cent grain over sweet cream		15.75	27.54

RIPENING CREAM

Time required	Temperature (°F)
12 hrs	65° to 70°
24 “	60°
72 “	45°

CHURNABILITY OF BUTTER FAT.

Proportion of Butter Fat in milk obtained by Churning according to the Food used :

	p. c.
Pasture and bran (June).....	91.16
Pasture alone (May).....	86.64
Hay, corn meal and bran.....	84.18
Hay and bran.....	81.37
Silage (mixed).....	81.25
Hay and corn meal.....	74.63
Silage and corn meal.....	65.69
Hay and starch refuse (gluten meal).....	63.89

SPECIFIC GRAVITY OF BUTTER IN COMPARISON WITH BEEF, MUTTON AND PORK FATS.

	Specific Gravity.
BUTTER.....	.911 to .920
Beef }2028 to .2045
Mutton }	
Pork }	

SCALE OF POINTS FOR JUDGING BUTTER.

- 25 Flavour : nutty, aromatic, sweet
- 20 Moisture : as free from beads of water as possible
- 10 Solidity : firm, not melting easily, or softening
- 25 Texture : closeness of grain, not greasy, distinct fracture
- 10 Colour : natural, even
- 10 Make : cleanliness, salting.

100 nicely packed.

A. H. PLUMMER,
Compton, Model-Farm, Que.

Swine.

PORK RAISING.

To the Editor of the *Journal of Agriculture*.

Dear Sir, Many farmers will say this is no new thing; everyone knows how to raise a pig! Very true; but I intend to give some information with regard to a new industry: bacon. Of course you all know what bacon is, the sides of the hog which have been salted and smoked. Our bacon in England is greatly esteemed, much more so than American bacon. The raising of pigs for bacon is quite different from that for salt pork. And the breed is somewhat different too.

In days gone by, the best breed of pigs for early maturity and fat at the same time, were the Berkshire, Poland-China and Chester-White. Each of these breeds had its advocates; who would make you believe that their special breed was the best. For bacon, those pigs who have long deep sides and are not inclined towards fat (1) are the best, such as the Tamworth: a pig with a reddish color, which crossed with Chester-White or the large Yorkshire, makes excellent pigs for making bacon. As so few succeed in pig raising, I wish to give a few rules to observe in order to succeed. First: a sow should be at least 12 months old before she becomes a mother, and the male at least 9 months old before service.

2nd: Do not leave the two together for any length of time. Some people allow them

(1) Will any pig "not inclined towards fat" pay for fattening? Ed.

often a whole day and sometimes a night as well together. This is a great wrong, more especially to the male; one single service — a long one generally — is quite sufficient.

3rd: There should be no near relationship between the male and female if you wish to have good success with the young ones. Pigs, in this respect, are somewhat like sheep and run out very soon by close in and in breeding.

4th: Do not keep them too fat, though in good condition and in warm, dry quarters. Do not feed the mother too heavy for a day or two before she farrows, and arrange a plank round her sleeping quarters about 6 inches from the floor so that the young ones may get under it, in case of the mother lying down and crushing them. For the first day or so after the birth, do not feed the mother too heavy, rather a light ration. After the young ones are accustomed to suck, in a few days increase the food, and feed well; for in order to provide the natural food for say a litter of 10 pigs she requires to be well fed. The mother should be from a good milking strain, as a sow should give as much milk in a day as a good milch cow. To show how much milk a good sow should give per day, you have to imagine the amount of increase in a litter of say 10 pigs for the first 30 days of their life. A litter at birth of, say, 10 pigs will weigh between 20 and 25 lbs, at the end of a month they will weigh all the way from 150 to 200 lbs. In order to give this almost miraculous increase they should get good nourishing food. Many wean their pigs too young; the usual custom is 4 weeks old, in some cases only 3 weeks. Those who have tried it, say that they should not taken from their mothers before 8 weeks; they have tried many experiments, by weighing, say, one lot of 10 at 4 weeks old. Keep track of what was given to the mother and they kept the young ones, for the next 4 weeks after separation, and took another lot treating them likewise, only leaving them with their mother; and the upshot was that those which were separated at 4 weeks ate more and weighed less than the other lot which were not separated.

Choose the best of the young ones for future pig raising, although if your sow proves a good mother and had a large litter, keep her for 2 or more years. You are now at the period in which you should change your process, from the old way, that is if you have a piece of clover, you should ring them and put them on the clover; if you have no clover, the next best thing is oats and vetches. Sow also clover and timothy, one acre of such oats and vetches should be quite enough for say 20 or 25 young pigs. Feed them on skim milk, an average of about 10 lbs a day; but if whey, about 16 lbs a day. This will keep them up to September, then boil some roots, such as potatoes, pumpkins, apples, mangel's or turnips, and with about 2 lbs of grain per day for each pig, you will soon have them up to the required standard: 180 to 200 lbs when dressed. Thus counting all at a fair rate, your pork should cost only about 3 cts per lb. Last fall, bacon hogs brought \$6 p.c. a good fair profit. We have only two manufacturers of bacon in this Province and they had to send thousands of dollars to Ontario to buy pigs, as they could not get them here fit for bacon. Here, Farmers, is a chance of a 100 per cent profit on your cost, go at it: there may be some few failures, but often we get as much good from our failures as from our successes.

Yours truly,

Chateauguay
April 4th, 1898.

PETER MACFARLANE.

A very good practical article. Notice the board to prevent the sow smothering her pigs. In England we weaned at 7 to 8 weeks. Please make lean, firm pig meat. A sow goes 16 weeks, and farrows to the day, almost to the hour. When a very young farmer, we had a capital breed of Suffolk pigs, and in and-in breeding reduced the litters by steps to 3, then to 2, and, at last, to 1. Error.

