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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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Oct. 1st, 1900

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The Farm.

NOTES BY THE WAY.

Draining.—In another part of this No. of the JOURNAL, in an article by Mr. Mortureux, mentioned is made of wood or stone as materials for the conduits. We used both in our comparatively extensive drainage-operations in England and, of course, they lasted, in *heavy clay soils*, for a considerable number of years, but in any country where pipes can be bought for a reasonable sum, the quantity of earth to be moved is so much less in pipe-draining than where wood or stone is employed, that we are sure that the former will always be found the cheaper process. *A fortiori* then must it be so here, where the price of labour is so high.

Prospects.—Mr. H. Hartney must be either a very bad judge of the prospective yield of the wheat-crop, or else the province of Manitoba is not yet void of miracles! As will be seen by the subjoined extract from one of our exchanges, he speaks of the yield of wheat in Manitoba as being improved by at least 300 per cent in the three weeks subsequent to his leaving that province, which the context would lead us to conclude was about the 18th September.

TORONTO, September 20.—As far as can be gleaned from interviews with western visitors, the outlook for Manitoba's wheat crop has assumed a very doubtful aspect. Such heavy rainfalls as occurred, sometimes lasting fifteen to twenty hours, have delayed harvest so far as to necessitate the employment of outside labour, whereby the farmer is put to much expense. If sufficient numbers do not take advantage of to-day's labour-

ers-excursion, part of the crops may be lost before threshing is done.

Speaking of prospects, Mr. H. Hartney, of the Manitoba Immigration Office, said: "When I left Manitoba three weeks ago, I calculated that ten bushels to the acre—about half a crop that is—would be realized. From private sources I now learn this will be greatly exceeded. A letter reached me from Deloraine last night, stating the yield would be higher than 38 bushels to the acre. In other districts, where only 15 bushels were expected, it is reported between 30 and 40 bushels is no over-estimation. Dauphin country promises well, too."

Export bacon-hogs.—At the Toronto Exhibition, the show of bacon-hogs was, as regards the prizes, almost entirely confined to the Yorkshires. Section 1st, out of 14 entries, each of "4 pure-bred hogs, most suitable for export bacon, the pigs to be bred by the exhibitor, and to be all from one breed," the first prize went to a capital lot of Yorkshires, bred and owned by D. G. Flatt & Son, Millgrove, second prize and third, and fifth to Yorkshires, and only the fourth to Tamworths. (Are the last coming into favour again? It is not more than four or five years ago, that Mr. Andrew Dawes, of Lachine, told me that, having given that breed a fair trial, he found that they were so loath to fatten that he had given them up. Ed).

In the 2nd section, which was for four hogs of any breed, cross or grade, most suitable for export-bacon, in which pigs of any breed could be mixed by the exhibitor, there were the same number of entries, and the prizes went exactly in the same order and to the same pigs as in the pure-bred section.

So it would seem that the breeders of the rapid fattening breeds of pigs, such as the Chester-whites, Poland-China, etc., have, for the nonce, very wisely given up all idea of competing in the export-bacon trade with the Yorkshire and other firmer-fleshed breeds. Hence, we conclude, that the firms that make bacon for the English market will, before long, find it advisable to raise the prices paid by them for hogs of the type required to make sound, streaky sides of what we used to call "breakfast bacon."

Sheep at Toronto.—A good show at Toronto, generally speaking. We were very glad to see that our friends at "Hillhurst Farm" forwarded

selections of their last imports of Hampshire-Downs to this show; and we were sorry to see that their lot was the only one exhibited. The flock consisted of three lamb-rams, a pair of full-mouthed ewes, two shearling ewes, and four ewe-lambs, and as *Farming* says, doubtless with truth, "all were of splendid conformation and character, showing good legs of mutton. All the sheep shown received prizes. There should be a greater field in Canada for this breed, as is hardy, has a large proportion of lean to fat, the ewes lamb early, and the lambs mature very quickly." The ewes of any breed of sheep may be led to lamb early if they are properly prepared, so as to be in season to take the ram early in the season, but this cannot be taught the ewes at once. Ewes that only wean their lambs in August will not be in full season till some time in October—this is of course a general statement. The habit of taking the ram early must be won or superinduced by degrees, year after year, particularly in this country, where it would hardly be wise to put ewes to the ram for the first time, as shearlings, so as to have them drop their lambs very long before grass, unless it turns out that silage is good and safe food for ewes, or a large extent of roots, mangels especially, is provided. As for Hampshire-lambs being given to "mature quickly," the annals of the Exhibition of the Smithfield Club will bear witness to the truth of that statement, these lambs almost invariably taking the first prize at that show, and, if our memory does not betray us, at the carcass exhibition, at the same club-show, last year, the Hampshire-lamb beat all the rest of the sheep.

One of the chief qualifications of the Hampshire-down is its "pre-potency" or power of stamping its own character on its get when put to ewes of other breeds. Hence the present peculiarities of the Oxfords, that look more like a Down than a long or middle-wool cross. This valuable breed was invented by Druce of Eynsham the thirties by a cross between the Cotswold and the Hampshire-down. Indeed, one may say that three-fourth of all the prizes given in England at fat-stock shows for cross-bred sheep are won by sheep having a cross of the Hampshire-down in them. Of course, this power can only be exercised by rams coming from a long line of unmixed ancestors; hence the reason that the valuable Shropshire is a failure when used for crossing, as the Hampshire has certainly been bred pure on his native Downs for

more than 200 years, while the production of the Shropshire, from the old Morfe stock, is of very recent date. We saw, at the Gloucester Meeting of the R. A. S. in 1852, the first pen of Shropshire that was ever allowed to exhibit, in a separate class, at the shows of that great society. We are convinced, and have long been convinced, that for the improvement of the common sheep of this province, no other breed offers so many advantages as the Hampshire-down.

As for hardiness, do we not recollect the flocks of Hampshire-down ewes, with their lambs, going to fold every night of the summer, on the Chalk-hills of Kent, at six o'clock, on the fallows, and never being let out until "the dew was off" in the morning? A ewe *must* be hardy to stand such treatment as that.

An ordinarily well-bred Hampshire-down lamb will weight from 72 to 80 lbs., dead weight, at the fall-fairs, such as Andover, Burford, etc., held in late August and early September, at which time the lamb would be probably about seven or eight months old. We, ourselves, have had in our flock of 240 Hampshire down ewes, several that, after losing their lambs from accidents, etc., have weighed from 13 to 14 London stone = from 104 to 112 pounds of mutton within a month of the lamb's departure.

Richness of milk.—The Danes seem to incline more to the practical man's opinion as to the effect of food on the richness of milk than to the theorist's idea that its richness in butter-fat cannot be influenced by food. An experiment was tried ten years in succession, in Denmark, and the result showed that the yield of milk per cow daily, under winter-feeding, was from 10.2 to 21.2 pounds, and under pasture-feeding from 20.3 to 21.7 pounds, and the fat-content of the milk for the ten years 3.15 to 3.21 for winter-feeding, and 3.30 to 3.47 for pasture-feeding, therefore, in Denmark has decidedly given the richer milk.

Self-sown Lucerne.—Plants do not spring of themselves; a seed is needed as a fountain of life. Two strange things happened at Ste-Anne's this summer; one of these we mentioned in an earlier No.: a field that had been sown with timothy and red-clover, in the oats, in the spring of 1899, showed no signs of that *trifolium* this spring; but about the middle of June, up came, in several

places, a plentiful plant of alsike-clover, not one grain of which has ever been sown on the farm! Again, after the crop of pease and oats had been severed in a piece of about 4 acres, we were astonished to see, after a heavy fall of rain, a great number of plants of *alfalfa*—lucerne—showing their heads, where lucerne had certainly never been sown. In the former case, it is possible that the seedman might have made a mistake, and sent alsike instead of red-clover seed; but in the second no such reasoning will do, as no seed of any kind was sown with the crop of pease and oats. The alsike must have come in the dung; some, we know, was brought from the village, and as Mr. Reford, the well known breeder of Ayrshire cattle, has grown lucerne for some years, it is probably from his farm that the hay or straw was sent, the consumption of which in the village of Ste-Anne brought with it the seed in question. And yet Mr. Reford never sells a load of either hay or straw! Only one suggestion remains; could the seed have got, and remained there in an undigested state, into the paunches of the 20 fat bullocks that were sold from Mr. Reford's farm to one of the butchers in the village? Possibly, but if that elucidation will not serve we can supply no other.

At last.—Really, we had given up all hopes of succeeding in a question we have been after for many a long wearisome year; for time is wearisome, when it bring with it unvarying disappointment. What the Editor of *Hoard's Dairyman* will say we are almost afraid to contemplate; but, we are informed, and by a well informed man, that the Managers of the Ottawa Experiment-farm positively intend to import for the farm a herd of *Dairy Shorthorns*. In truth, it is almost too pleasant hearing to be true. Four things; *the* four things that we set our hearts upon when we undertook the management of this periodical, in 1879, viz: 1. The introduction of rape; 2. The spreading of the lucerne crop throughout the province; 3. The introduction of Hampshire-down sheep, and 4. The importation of Dairy-Short-horns, have all, what our reporters, culling from the erudite papers of the States, call "materialised!" We began to believe that we were doomed to the perpetual defeat of our wishes, not wishes for our own benefit, for we are so hard upon the longest span of human life that we can hope for no advantage from these improvements; but we must own to having had a longing that we

might leave some kind of legacy to those who are to come after us, and if the four things mentioned above do not work a great change for the better in the farming of the province of Quebec, we shall be content to go down to the grave as being not so good a judge of the improvements needed in this country as we thought ourselves to be.

DEATH OF SIR JOHN BENNET LA WES.

We deeply regret to announce that Sir John B. Lawes died at Rothamsted at eight o'clock on Friday morning. The cause of death was an attack of dysentery.

Sir John Bennet Lawes, Bart, F. R. S., D. C. L. Oxon, D. Sc. Camb., L. L. D. Edinburgh was born on December 28th, 1814 and succeeded to his estate at Rothamsted, in Hertfordshire, in 1822. Mr Lawes was educated at Eton and at Brasenose College, Oxford, where he remained from 1832 to 1835. During his academic career he displayed at once a great partiality for the laboratory, and, on leaving the University, spent some time in London, for the purpose of studying in a practical manner the science of chemistry. Possessed of independent means, a handsome property, and a beautiful old manor house and demesne, he at once interested himself in agriculture. In October, 1834, he first commenced regular experiments in agricultural chemistry, on taking possession of his property and home at Rothamsted, and from that date until his death Sir John Lawes has unceasingly been applying his scientific knowledge to the solution of questions affecting practical agriculture. In the commencement of his experiments, among other subjects, the effect of bones as a manure on land occupied his attention for some time. A friend and neighbour, the then Lord Dacre, particularly directed his notice to the fact that bones were very variable in their effect in different soils. Several hundred experiments were accordingly made, some upon crops in the field, and others with plants in pots, in which the constituents found in the ashes of plants as well as others were supplied in various states of combination. Striking results were gained from these experiments, in which the neutral phosphate of lime in bones, bone-ash, and apatite were rendered soluble by means of sulphuric acid, and the mixture applied for root crops. The results obtained on a small scale in 1837-8-9 were such as to lead to more extensive trials in the field

in 1840-41, and to the final taking out of a patent early in 1842. This being done, he established large works in the neighbourhood of London for the manufacture of superphosphate of lime, by which name the manure is known which has produced such a revolution in the science of agriculture. Not content with the individual profit which he derived from his investigations, he continued his work with the assistance of a practical chemist. In 1843 he engaged the assistance of Sir John H. Gilbert, the present director at Rothamsted, and undertook with him a systematic series of agricultural investigations in the field, the feeding shed, and the laboratory. The laboratory consisted, first of an old barn, but this very soon became insufficient for the growing requirements of the new science. Happily an opportunity offered to build another one. In 1854 a testimonial was subscribed for presentation to Sir John Lawes, to express the appreciation of the services he had rendered to British agriculture. The committee proposed to extend the money in plate, but he at once suggested that it should be devoted to providing a new laboratory which would enable him the better to prosecute and extend his inquiries, the publication of the results of which would be the best return he could make for the honour that had been conferred upon him.

The great services of Sir John Lawes, were widely recognized. In 1881 the German Emperor awarded the gold medal of merit for agriculture to Sir John Lawes and Dr. Gilbert; and in the following year, in recognition of his transcendent services to the great national industry, the Queen created him a Baronet. The jubilee of the Rothamsted experiments was celebrated in 1893, when Sir John Lawes and Dr. Gilbert were the recipients of numerous addresses from the scientific societies, while Dr. Gilbert received the honour of Knighthood. A granite memorial was raised by public subscription at Rothamsted to commemorate the occasion, and was inaugurated by the Prince of Wales, while a portrait of Sir John Lawes, painted by Professor Herkomer, R. A., was presented to Lady Lawes. Sir John was elected fellow of the Royal Society in 1854, and in 1867 the Royal medal was awarded to him, conjointly with Dr. Gilbert, by the Council of the society. He also received a gold medal from the Imperial Agricultural Society of Russia, and the Albert medal in 1893 from the Society of Arts. Cambridge conferred on him the Hon. D. Sc. Degree in 1894. He took

a cordial interest in the welfare of the Royal Agricultural Society, of which he was elected a member in 1846. He had occupied a seat on the Council since 1848, was elected a Vice-President and a Governor in 1878, and a Trustee in 1891. When, at about the time of the jubilee of the Rothamsted experiments, he was offered by the Council the highest honour in its power to bestow, he pleaded advancing years and increasing deafness as reasons for not succeeding to the office of President of the Society.

The Rothamsted Experiment Station has been from the first wholly unconnected with any external organisation, and has been maintained exclusively at the cost of Sir John Lawes himself. Independently of the large sums which he spent on it during his lifetime, he set apart no less a sum than £100,000, and certain areas of land besides, for the purpose of keeping up the system after his death. This is held in trust by a deed executed in 1889, and a Committee of Management was appointed.

UNDERDRAINING.

To allow as much as possible the free passage of air and water in his soil, so that its plant food may be made available by the former and taken to the roots of the plants by the latter, seems to be the chief aim of cultivation. This ideal condition however, is attainable only when the soil is well drained, that is when, through natural or artificial conditions, the excess of water which it receives can be easily and quickly got rid of. The soil should not contain more than 15 or 25 % of water. All water in excess of this amount is injurious. This excess however is very frequently to be found in our cultivated lands, owing to lack of proper drainage. Let us consider briefly the evil effects caused by the excess of water in the soil.

Let us imagine a land where an impervious sub soil prevents the percolation of rain water, such are often to be met with. In the spring, no issue being provided for the water, the excess of it will have to be evaporated before the land can be worked. This evaporation, besides being a slow process, is a costly one. Water in evaporating takes away from the soil a large sum of heat, leaving it cold, unfit for the seed which is thrown in or for the growing plant. Furthermore, the water which remains for a long time immediately beneath the surface soil, prevents the extension of

the plant roots, and consequently the full development of the plant.

But through the course of summer, the land has somewhat dried. Air has now taken the place of water, filling up the pores of the earth. A much needed summer shower comes which fills up the upper ends of the pores. The air contained below having no outlet to escape by, remains imprisoned, and exercising a back pressure upon the water prevents its entrance in the soil at a greater depth than an inch or two. Thus, after a shower an undrained land may be as dry as ever, the water being forced to run off the top. Thus a drain is a *safe guard against drought*.

On the other hand let us consider a land where subterranean conducts have been placed at the right depth. In the spring, the water resulting from the melting of the snow finds through them a ready exit. Warm air and warm showers following impart to the soil, in passing through it, the heat which it needs for the prompt germination of the seed, bring to it plant food contained in the atmosphere, and help in unlocking its fertility. The roots being unimpeded in their growth have a much larger field to operate upon, and consequently have less to fear the droughts of the summer.

This is not mere theory. These are facts observed by practice and explained by science. Of all agricultural improvements, underdraining is the one which proves the most profitable. When well carried out, this operation cannot fail to repay amply the farmer. The writer has seen on many farms, and particularly on Mr. W. Davidson's farm, at Bethel, Shefford, striking instances of the effects of underdraining. A land which, though much accidented, was too wet in many places, owing to the presence of numerous springs has been considerably improved by the laying of several stone and wooden drains. (1) Many parts, the culture of which was much delayed in the spring owing to an excess of water, can now be worked two weeks earlier, and clover and timothy have taken the place of wild grass in some pastures.

To improve the texture of heavy clay lands which are so common in our province, drainage is the very first essential. The excess of water which heavy clays always retain must be removed before any other amelioration can be thought of.

(1) Draining off springs and *thorough* drainage are two very different things. Ed.

The effects of drainage are not so quickly apparent on heavy clays as in other soils. Several years must elapse before full benefits of the operation can be secured, but if the returns are not quite so quick, they are none the less remarkable. Little by little, the clay loses its tenacity; the soil soon crumbles more easily under the action of pulverising implements, and can be worked at a much earlier date in the spring.

It is the common belief among many of our farmers that underdraining is a very expensive operation, and hence impracticable on the majority of our farms. This is a mistake. If we should reckon the time spent every year in the making and the keeping of ditches in good order, so as to insure a superficial drainage more or less perfect, we would soon come to the conclusion that underdraining is the cheapest means of drawing off the excess of water of our lands. We can make drainage more or less expensive if we wish to make it more or less permanent. Tile drains may be used at some cost but they are by no means indispensable. Stone or wooden drains made at a trifling expense, have been known to last, and work perfectly, for a great many years. These two materials are usually plentiful on most of our farms, and could be advantageously used for the making of drains. (1)

CHS. MORTUREUX.

FARM LABOURERS' EARNINGS.

A voluminous report by Mr A. Wilson Fox, on the Wages and Earnings of Agricultural Labourers in the United Kingdom, has been issued by the Labour Department of the Board of Trade. Mr Fox states that the object of his report is to show the weekly wages in cash and the total earnings also, including extras in money and in kind. One of the numerous tables gives the average weekly wages in money of ordinary farm labourers for 1898, the average extras per week, and the average earnings per week of labourers in each of the counties of England. The lowest average weekly rate is 11s. 5d. for Suffolk; and extras in money and in kind bring the earnings up to 14s. 5d. the lowest average total for any English county Dorset, Wilts, and Norfolk also come out with less than 12s, as the ordinary weekly money wages. The

nine counties in which average weekly earnings, including extras, are lowest, according to the report, are these:—Suffolk, 14s. 5d.; Oxon., 14s. 8d.; Norfolk and Dorset, 14s. 9d.; Wilts, 15s.; Gloucester, 15s. 2d.; and Hunts, 15s. 2d. The eight counties in which the average is 19s. or more may also be given. Durham, 20s. 9d.; Northumberland, 20s. 2d.; Derby, 19s. 11d.; Kent, 19s. 10d.; Middlesex, 19s. 5d.; Lancashire, 19s. 4d.; Notts, 19s. 2d.; Surrey, 19s. The average for the main divisions of the United Kingdom are given as follows:—England, 16s. 10d.; Wales, 16s. 5d.; Scotland, 18s. 1d.; Ireland, 10s. 1d.; Besides extra on price-walk — *Ag. Gazette.*

THE CULTIVATION OF STUBBLES.

For the cultivation of stubbles the weather lately has been splendid, and many a capital tilth has been made in the early districts. As to this cultivation, it is a curious fact that in some parts of the country there is no knowledge of the method commonly pursued in the Eastern counties, and known there as "backstriking." The operation consists in the balking of the land, and the taking up of the balks at once. That is to say, the land is double-balked in each bout. Occasionally a field is single balked, a furrow slice being turned on to an equal width of unploughed land, leaving the taking up of the balks to be done afterwards. This is a capital method of killing weeds, as the upturned soil is dried through quickly in sunny weather, and afterwards the strip left underneath it is turned upside down in its turn. The only objection to the plan is that the strips of stubble land left after the first operation are apt to become too hard in hot and dry weather by the time that the single balking is finished, "Backstriking meets this objection but is hardly as effective as the other plan in killing weeds. But either method is superior to ordinary ploughing with an old fashioned plough, as it brings weeds to the surface instead of burying them, and leaves the land in fine form for the harrows. The use of the digging plough, however, has to a great extent superseded the methods of cultivation named above, as that plough breaks up and scatters the soil, leaving it well for harrowing. — *Ag. Gazette.*

(1) The extra quantity of earth to be mould is against the use of wood or stone in a country where labour is so costly as in Canada. Ed.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

THE AUTUMN.

With this season of the year comes the necessary change of costume suitable for it. The pretty light summer dresses must be carefully folded up and put by till wanted next spring, all washing material should be washed, well dried and put away unironed, as this will simplify matters if any alteration has to be made the following spring and as children are apt to grow out of their clothes, they very often have to be entirely remodeled to suit them.

At present the fashionable dress is not such as to make the last year's one unswearable, on the contrary, a slight alteration will alter the whole dress.

A pretty blue costume of last year trimmed with cream silk, the Eton jacket of which had reverses of the same, which has now been picked off, care being taken to press the parts where the silk was sewn on, give the whole costume a new tone, and as the time of year necessitates the buttoning up of the jacket, which is pointed in the front like a waist, the back shows about one to two inches of some very pretty belt between the jacket and skirt, and if care is taken in the colour of the belt it will be all the nicer.

In the case I mention, a Scotch plaid was worn and it was a great success.

A nice lace tie will be needed for the neck, tied well with good long bow and ends; speaking of ties why are there so few people who can really tie a neck-tie well? Some people will take a nice bit of old lace and by a little picking and judicious twisting turn out a better article than those who can buy what they want.

The newest coats are rackbacked and are about three-quarter length, they are seen with and without capes, but as they do not suit every body, their reign bids fair to be a short one, as they really are only fit for tall or slightly built people.

For the Autumn and Winter blouse there is a large choice in fabric and colour to select from. Pretty French flannels often printed in shawl pattern, while others of plain material are to be trimmed with military braid. Those who have the time and gift to do so will find themselves very much in the fashion by embroidering, in silk,

pretty designs of flowers and outline the same with narrow military braid.

COOKERY.

A very pretty way of serving a mince is to enclose it in a potato wall, or casserole, as it is sometimes called. To make this, have plenty of mashed potatoes, season them a little, mix in some butter and the yolk of an egg, then they will mould into any shape you please. When the potatoes are placed round the hot dish, take the backs of two wooden spoons, one inside and one outside, and shape the wall, raising it as high as possible. If liked, it may be brushed over with a beaten egg, and browned in the oven, or it may be kept white, according to the kind of meat it is to receive.

MUTTON AND CAPER SAUCE.

Wipe the leg with a damp towel, put into a kettle, cover with boiling water and simmer gently for 15 minutes to every pound. Add a teaspoonful of salt. When done, take up, lay the joint on a heated dish, garnish with parsley, and serve with caper sauce. Mix two tablespoonfuls of butter and one of flour with cold water until smooth, put into a tin cup set in boiling water, and stir till it thickens; add a teaspoonful of capers, take from the fire and serve.

MACARONI VEAL.

Mince half a pound of cold veal, mix with four ounces of minced ham and two tablespoonfuls of bread-crumbs, pepper, salt, and powdered mace to taste; add a seasoning of chopped parsley, lemon peel, thyme, and marjoram, a squeeze of lemon juice, a well-whisked egg, and enough stock to moisten the whole. Put this, when mixed smoothly, into a pie dish, cover with half a pound of macaroni which has been boiled till tender in salt and water (about half an hour), put a layer of fine breadcrumbs over this, stew bits of butter over it, and bake for 25 minutes. If not sufficiently browned in the oven, may be finished before the fire.

FISH BALLS.

Any cold flaky fish will do for this, but it is nicest when the fish is freshly boiled. Shred very fine, and add a sauce made of one ounce of butter, one tablespoonful of flour, and half a cupful of

milk ; put all in a saucepan ; the sauce should be very thick. When all is hot, add two beaten eggs, pepper and salt. Then drop the mixture, which should be like batter, from a spoon into very hot fat. It will puff, and be very light.

MACARONI À L'ITALIENNE.

Put four ounces of good macaroni, as little broken as possible, into a saucepan with three pints of boiling water. Boil five minutes. Then pour off the water and place the macaroni in a stewpan with a pint of stock, adding salt and pepper, and let it simmer gently until the macaroni is tender, not soft and flabby. Most of the stock will be absorbed by the macaroni. So a little prepared extract of meat may be added, thickened with a little flour. Lay the macaroni, &c., in a hot dish, and grate one ounce of Parmesan cheese and half an ounce of good English cheese over it, with a little butter. Hot tomato sauce may be poured over it, or served separately.

CHEESE AIGRETTES.

Dissolve an ounce of butter and stir into it a tablespoonful of flour ; add half a pint of warm milk, and stir over a fire until a smooth paste is obtained. Add whilst hot salt, cayenne pepper, and grated cheese enough to give a strong flavour. When getting cool mix in carefully the yolk of a large fresh egg. Bring half a pound of lard up to boiling point, and then drop into it small pieces of the paste, and boil rapidly. They should puff out and be a beautiful golden brown. Roll each aigrette in grated cheese when it has drained, and serve on a paper doyley whilst hot. They are not good cold.

QUEEN'S CAKES.

The following is a favourite recipe : Two eggs, their weight in white sugar and flour, two and half ounces of butter, one tea spoonfull of baking powder, a few drops of essence of lemon, and one ounce of currants. Cream the butter, eggs, and sugar first, then add the flour and baking powder, beat the mixture well for ten minutes, then add the currants, pour into small tins and bake in a hot oven.

PICKLES.

For pickles always use glass jars or unglazed ware. All vegetables to be pickled should be

quite fresh, and the best quality vinegar and spices used. Use an enamel sauce pan when boiling vinegar.

MIXED PICKLE.

Ingredients required : 1 small cauliflower, 2 cucumbers, $\frac{1}{2}$ lb. French beans, $\frac{1}{2}$ lb. small pickling onions. To each quart of vinegar, add one ounce each of ginger and peppercorns and six cloves, boil for 15 minutes then let it cool.

Break the cauliflower into small sprigs (do not use any of the leaves or stalk) ; cut the cucumbers into thick slices, without removing the peel ; peel the onions with a silver knife. Put all these into a jar with the beans, and pour over sufficient cold water to cover them ; drain off the water immediately, and measure it. Thus you ascertain the exact amount of vinegar you will require. Lay all the vegetables out on a dish and sprinkle with salt, letting them remain for twelve hours or so. Drain away all moisture from the vegetables, and shake them in a cloth to still further dry them.

Arrange them in glass bottles, and if a few red chillies are also introduced, the appearance will be improved. Pour over the vinegar and cork or tie down the bottles ; the pickles will be fit for use in about a week.

TOMATO CHUTNEY.

Ingredients : Three and a half pounds of green tomatoes, 1 tea-spoonful each of mustard seed, ground ginger, and allspice in powder, 1 onion, 10 cloves, 1 quart of best vinegar, 1 lb. of brown sugar.

Peel the tomatoes, and cut them in small pieces, put them in a preserving pan with the spices and vinegar. When nearly boiling, add the sugar and the onion whole. Boil gently for about two hours or until it looks clear ; the onion is to be removed before it breaks into pieces. The chutney is turned into small pots, and tied down like jam ; it will keep a long time if properly boiled. If green tomatoes are not obtainable, use red ones, with rather less vinegar.

PICKLED ONIONS.

Use the small silvery-looking onions, and peel them with a silver knife. First pull the outside skin off with fingers, then peel off one more skin with the knife, and as they are done drop them into glass pickle bottles, and sprinkle amongst

them a few allspice and peppercorns. Fill up the bottles with cold vinegar, and cork them; the pickles will be ready in a fortnight, but will not continue crisp more than six months. Spanish onions, cut in slices, can be treated in the same manner, and they can be done all the year round.

When a carpet becomes a little dingy, it may be considerably improved by sweeping it with a broom dampened in water to which a little ammonia has been added. The water should be put in a pail, the broom dipped into it and the drops of water shaken off. When the broom becomes dry it must be dampened again, and the water changed when it becomes dirty. If an old Brussels carpet is very much soiled, it should be thoroughly beaten, and spread out on the floor, then washed with warm water and fresh ox gall or ammonia in the proportion of one pint of gall to one gallon of water. Wash a small piece at a time, rinse with clean water, and wipe as dry as possible. The windows of the room should be left open, so that the carpet will dry quickly, and if it has been properly rinsed, the colors will look almost as bright as new.

The Garden and Orchard.

(CONDUCTED BY MR. GEO. MOORE).

PROPAGATION.

(Continued).

Hard wooded or shrubby plants are much more difficult to propagate by means of cuttings than those with soft, herbaceous stems.

The age of the cutting is the first consideration. The green or soft part of the last year's growth should be chosen and this should be cut off at the union with the former season's growth; these cuttings must be placed in quite clear silver sand and are usually covered with a bell glass, the object of which is to keep them continually surrounded with a moist atmosphere upon which they will survive until roots are formed; these bell glasses however should be wiped occasionally with a dry cloth to prevent the collection of too much moisture which would cause decay before the rooting process was completed.

The successful propagation of hard wooded plants from cuttings requires the utmost care and attention to details; an expert hardwood propa-

gator is looked upon as a clever horticulturist and commands a higher rate of wages in the large nursery establishments than a workman of ordinary ability.

Cuttings of some woody plants, and many herbaceous ones, are capable of forming roots in water; everybody who is at all familiar with plants knows how easily an oleander will strike root in water. The vessel used for this purpose should be a bottle of white glass with wide neck, so as to permit the removal of the roots without injury; the cutting should be of green wood, and taken during the growing season; the water should be kept at a temperature of about 70° Fahr. and the cutting immersed in it from an inch to an inch and a half. The bottle should be kept in a warm room, and exposed to the sun's rays, or it may be plunged in a bed of warm leaves or other slowly fermenting matter; no manurial ingredient should be introduced into the water, and the plant should be removed from it and placed in earth as soon as the roots are well formed.

To the amateur, the striking of cuttings in water is very interesting: cuttings struck in sand or soil undergo their changes in the dark and cannot be observed as they proceed, but cuttings placed in water are clearly observable and instructive in all their progress, either to decay or development and are a constant source of amusement; they require no extra care and when they succeed they never droop but grow surely and steadily to their full plant development.

Cuttings of some shrubs, chiefly of the deciduous species, root freely in the open ground, being taken in a half ripe condition at the end of summer, and put in the soil in a cool, shady place. Currants are propagated freely in this manner, and gooseberries, to some extent, but not with so much a certainty of success. Hardy roses too, will root in the same way, especially the climbers such as the Ayrshires and noisettes. but the hybrid perpetuals do not strike root so freely neither do they grow so vigorously or bloom so abundantly as when budded on the Dog rose or Manetti stock.

Some plants are increased by means of stolons; these are of two kinds one subterranean and with a tuber at its end, as in the potato, and the other growing out of the summit or collar of the root running along the surface and forming new plants by striking perpendicular roots into the earth at certain intervals as in the strawberry.

If these stolons or runners are allowed to remain they grow into a matted mass but if removed and transplanted singly they make good healthy plants and increased their number very rapidly. Propagating by layers is somewhat similar to stolons: a branch of a shrub is partly severed from the parent bush and laid flat upon the earth, and then an incision is made in it, either in the new wood or at the point where it joins the former season's growth, it is then made firm to the soil with a wooden hook or peg, covered with a few inches of earth and in due time it takes root, when it is cut off and planted in nursery rows; this plan is adopted in cases where plants or shrubs are difficult to increase by cuttings. Budding is engrafting buds or eyes of one plant upon the stocks of another plant; it differs from grafting, in its proper sense, in the fact that a scion or graft is a piece of the branch of the tree which it is intended to propagate, which contains the wood and which is engrafted upon the stock in the different manners we shall presently notice; while a bud is only the embryo of a branch from which the wood has been removed only leaving a piece of bark attached to it, enough to keep it in its place on the stock to which it is attached. Budding and grafting will not be successful unless the bud or scion are nearly related to the stock.

There used to be a foolish idea in the minds of some that it was possible to change the nature of one species by budding or engrafting it with another, but any one who has studied vegetable physiology will at once detect the fallacy of such an idea.

There are three process of budding, the Escutcheon, the Tube, and the Flute or annular.

Escutcheon budding is sometimes performed with wood under the bark. The operator commences by cutting a bud from the wood of the latest growth, with bark attached about half an inch above the eye and an inch below it, he either leaves all the wood or, deftly, with the point of his budding knife, removes it, being careful not to tear out the eye of the embryo bud; if the wood is carefully removed the neatest union is formed because the bud inserted adheres more closely to the wood of the stock. The bud having been prepared, the next operation is to make a slit in the bark of the stock to receive it, and this is done by making a cut across it and another lengthwise in the shape of a T. The bark is then raised a little

by means of the ivory handle of the budding knife, which is made with a point for that purpose, and the bud slipped into the incision between the bark and the wood, a bandage of some soft material that will not bruise the bark must then be tied round, just firmly enough to keep the bud in its place but not too tightly.

Budding must always be performed, by using the young wood where it has become a little solid, not too near the point, from which to cut the bud, and inserting it also in the stock at the season when it is full of sap, hence budding must always be done while stock and scion are in full growth. If it is deferred until the sap is dry it cannot be performed successfully: the bark of the stock will adhere so firmly to the wood as to render it impossible to open it to receive the bud, and the bud will not grow into the dry wood, even supposing it could be placed upon it. Some operators open the bark before cutting the bud, but I prefer to cut the bud first because then the wound in the stock has no time to dry before the bud is inserted, and this cannot be done, and the whole bandaged up to quickly to prevent the action of the air interfering with the healing process, which should at once commence.

The leaf of the bud should be removed, except its foot stalk, which will make it more convenient to insert the bud in the stock.

Most buds remain dormant until the following spring, but hybrid perpetual roses of the most vigorous varieties will sometimes make a good growth the same summer and flower in the autumn; the buds which remain dormant, however make the best plants, therefore early budding is not the best, generally speaking.

The buds should be carefully watched to see if the growth of the stock has caused the bandage to cut into the bark, and then it must be at once taken off. The stock must be cut off a little above the newly inserted bud, but not so close as to injure it at first; after the bud has made a shoot this spur should be cut close to the budded shoot so that the joint will be quite smooth and no spur left to decay. I do not like tying the new shoot to the stump left on the stock, but prefer a stake to be used even although it may involve a little more time and material.

This stake should be tied firmly to the stock and the new shoot tied to it, otherwise there will be great danger of being blown off by the wind, or broken by heavy rain, because at the union of the

bud with the stock it will, at first, be very tender and easily separated.

Grafting, unlike budding, must be performed while the stock and scion are in a dormant state. That is in the spring just before growth commences.

(To be continued).

QUEBEC CITY AGRICULTURAL AND HORTICULTURAL SOCIETIES EXHIBITIONS.

The Exhibitions of these societies were held conjointly on the 4th, 5th, and 6th of September and were a decided success. There was a highly creditable display of horses, cattle, sheep and swine and only a small number of poultry which however were very good. The classes in the horticultural department were well filled, the plants and flowers, although not so numerous as on former occasions, were specimens of good cultivation and there were a number of elegant bouquets, baskets and floral designs. Fruit and vegetables especially, the latter were very good although not so well matured, in consequence of the lateness of the season, as they should have been.

An interesting and practical part of the programme was the competition for growing crops of silage corn, mangels, turnips and potatoes. For these there were ten competitors, four premiums being offered in each class which were distributed pretty equally among them, every farm visited showing signs of superior cultivation.

This competition for growing crops is excellent because it encourages thorough cultivation of the general crop and not merely the production of a few selected specimens for Exhibition neither can a competitor buy or borrow a growing crop. The prize winners in the class were the following and deserve honorable mention here for the excellence of their exhibits:

1 ACRE.—SILAGE CORN.

- 1st, Mr. T. Delaney, Little River, Quebec.
- 2nd, Messrs. Tozar & Co, Little River.
- 3rd, Mr. James O'Neil, " "
- 4th, Mr. James Perry, " "

2 ACRES.—SWEED TURNIPS.

- 1st, Mr. John Jack, Little River.
- 2nd, Mr. Wm. O'Neil, " "
- 3rd, Mr. Thos. Moore, St. Foye.
- 4th, Mr. Alex. Moore, Little River.

2 ACRES.—POTATOES.

- 1st, Mr. Michael Byrne, Charlesbourg.
- 2nd, Mr. Gauvin, Ancient Lorette.
- 3rd, Mr. T. Moore, St. Foye.
- 4th, Mr. John Jack, Little River.

$\frac{1}{2}$ ACRE.—MANGELS.

- 1st, Mr. Wm. O'Neil, Little River.
- 2nd, Mr. John Jack, " "
- 3rd, Mr. Thos. Delaney, " "
- 4th, Mr. James Perry, " "

The judges were Messrs. Wm. Lee, Geo. Moore and Chas. Julien, and it is gratifying to remark that these gentlemen performed their somewhat difficult duty to the full satisfaction of all concerned.

But probably the most interesting exhibit in the vegetable line is a lot of "Bobs" potatoes exhibited by Mr. Michael Byrne, of Charlesbourg. They were grown from seed sent out from South Africa by Mr. Réal Huot, son of the late Gaspard Huot, who was a member of one of the contingents which went to the war. The seed in the shape of two potatoes arrived here in June and Mr. Byrne immediately planted them. To day he has quite a nice lot of fine looking tubers which he will use for seed again next spring and they will henceforth be known as "Bobs" potatoes. Mr. Byrne says they are large and floury and promise to be one of the finest potatoes grown. They are of the Early Rose type but much superior in cropping qualities.

THE ANNUAL EXHIBITION

OF THE

Montreal Horticultural Society, and Fruit
Growers Association of the Province
of Quebec.

Sept. 11th and 12th.

22 Sept. 1900.

MR. BOWLES,

I have been asked by Mr. Jenner-Fust of the Provincial JOURNAL OF AGRICULTURE, to furnish a report of your late show, would you kindly post me, early as possible, names of judges of the different classes, and names of prize winners in Cottage garden competition, and Juvenile department. Also, was June show of Herbaceous cut bloom a success, by doing so you would oblige

Your truly,

ALEX. GIBB.

JUDGES :

Plants : Stanford & Dunbar.

Fruits : Robt. Brodie & C. P. Newman.

Vegetables : Wm. Ross & J. Betrix.

Cut Bloom : Jos. Bennett & A. Wilshire.

Mr. Bowles informs me that in the Cottage garden competition, there were no entries, until too late for competition, and that there is every prospect of a revival of interest in Horticulture, Mr. Vincent Meredith having promised to raise six subscriptions of \$50 each towards next year's prize list.

A. G.

The Annual Exhibition of the Montreal Horticultural Society, and Fruit Growers of the Province of Quebec was held in the Drummond Hall, this year. I suppose the management was justified in not incurring the heavy expenditure attending the taking of the Win 'sor Hall, but the smallness of Drummond Hall, greatly reduced the effectiveness of a fairly good, though limited exhibit. However, the executive committee certainly made the best of the space at their command, and enhanced the attractions and apparently the space, by having mirrors at intervals along the walls, festooned with asparagus plumes and vines, and the stage grouped with a really fine collection of Palms, Ferns and other foliage plants from the Mount Royal Cemetery Co. (not for competition). The attendance of the public was small, and even members did not show up in great numbers owing no doubt to the unfavourable weather. It is to be hoped the proposal that the city contribute in future a money grant, in aid of the society, be carried out, for unless the executive are backed up so that public interest may be revived and stimulated, by attractions apart from the show, the whole thing is in danger of collapse.

Mayor Préfontaine on declaring the show open, gave some encouragement, by his remarks, to the above proposal, and Alderman Gagnon, chairman of the Park's Committee, should be kept up to the interest he evinced in his speech at the opening of the Horticultural Associations Convention. With such an influential list of officers and directors, and the committee containing the names of six practical gardeners, it is to be hoped the future shows will regain their old time prosperity, but so long as a society is not able to pay its prize-money in full, exhibitors cannot be

expected to contribute time, expense, damaged plants, etc., for the bare honour of the thing, as one old competitor remarked, the percentage he received on last year prize money barely paid for cartage, another generously said: "oh! I did well in good times, so I must help in bad."

As the local papers gave the prize winners in full, it will not be necessary to give a detailed list.

In Class A. (open), Plants.

Mr. H. B. Angus took, as usual, a decided lead, his gardener, W. J. Wilshire, showing fine well grown specimens of Adiantums and other ferns, Palms, Crotons, Anturinne, Dacnusa, Cycas, and the Orchid, *Vanda cœrulea*, being especially fine. Mr. Robt. McKay, through his gardener H. W. Mayer, was to the fore, with begonias of the rex, and tuberous varieties, store and greenhouse foliage plants, *Lycopodium Scandens*, a good specimen of this pretty climber ferns, and *Maranta Zabrina*. Mr. J. H. R. Molson, gardener J. Trussel, was first with his old favorites Geraniums, single, double and variegated, *Zonale* and *Hydrangeas*, C. A. Smith brought from Lachine, Mr. T. A. Daves' place, six very nice table plants, good plants of distinct *Coleus*, *Asparagus Sprengeri*, and a basket of ferns. Mr. Mussen's gardener, W. Whiting, was first with *Gloxinias*, J. Rubenstein, second.

The plants this year is above class were clean and well grown samples, the variegated varieties rather lacking in colour.

Class B. (open) Cut Bloome.

In the collection of cut Blooms, 15 square ft. G. Trussels and C. A. Smith were first and second with an excellent variety of out door cut flowers, the flat compact mode of arranging these collections does not add to their attractiveness, a few points added in favour of effective arrangement would be a great improvement to this feature of a flower show.

C. A. Smith, 1st collection of 24 Asters, Dahlias, double and single, Petunias, Zinneas and Marguerite carnations; Mr. Edgar Johnson, Lennoxville, was a good first with a fine collection of sweet Peas, Pansies and Verbenas; G. Trussels had the lead with Gladioli; Miss Isabella Harkom, Melbourne, R. Jack & Son, Chatearguay Basin, and D. Williamson were also successful competitors in above class. Cut-Flowers as a rule were far ahead of last year in size of bloom, and substance, especially Dahlias, Asters and Gladioli, no

doubt the season being more favorable to their development than of late years. Bouquets and Vases in this class were more numerous than usual. Wild flowers shown by R. Jack, and Lilliams, by D. Williamson were attractive.

Class C. (open) Fruits.

APPLES.—R. Jack & Sons were first in collection of 15 varieties, also in 6 varieties. Mr. Malcolm Smith, Lachute, being first for 12 varieties. Miss Julia Fulton, Maritana, also winning here as well as in the single varieties, in fact the above names took all before them in apples, which were a very good exhibit; but short in colour and ripeness, but ahead in size, the fact of a week's difference in holding the show may account in some measure for defects, the wet season for increased size. Pears and Plums are not in great variety in this district, therefore the prize-takers were limited to, though the crops of both are unusually prolific. Miss Julia Fulton, 1st prize for Pears, Flemish Beauty, W. H. Mayer and G. Trussel, taking 1st and 2nd for 3 varieties, R. Jack & Sons taking the lead with Plums, also for basket of fruit for dessert, and basket of out-door fruits grown in this province, both were in good variety and tastefully arranged. Out-door grapes were not in good character, and were not ripe, this district certainly not being successful in producing saleable out-door grapes, Messrs Jack and Trussel divided honours for above. In grapes grown under glass, a better showing was made by W. J. Wilshire and Mr Mussen's gardener, W. Whiting.

MELONS.—Montreal melons are famous even as far as New York, still the competition is almost nil. Frère Louis Morand and G. Trussel being 1st and 2nd respectively. The splendid samples of melons for size, seen in the stores this season, are remarkable, but I am told they are deficient in flavour, as is everything, but specially melons.

Class D. Vegetables (open) for table use only.

The above heading should induce competitors to look first to quality, mere size, in many cases, being a positive drawback, in fact some of the samples, should be classed among agricultural products. The Frères Ignace Morand, of Notre-Dame College, and Louis Morand of St. Laurent College, were the leading prize winners, with G. Trussel and C. Smith, in above class, and in almost every case, very fine specimens were staged, the evidence of the season being marked by large and clean samples. This applies espe-

cially to corn and root-crops, onions, as usual, being prominent. Ignace Morand was awarded special prize for collection of vegetables. This concludes remarks on open classes, which one might say constituted the show. The absence of competitors from a distance was marked, no doubt owing to smallness of prizes.

Class E. Amateurs.

PLANTS.—Mr. Israel Rubenstein carried all before him, taking no less than 15 first prizes with some good plants notably a finely grown *Ficus elastica* (rubber-plant) a large *Hydrangea*, and a Palm; also rustic stand of plants, and a window box. Mr. Thos. Grimsdale, Outremont, was second where he competed, excepting for Tuberous Begonias, in which he took first.

CUT BLOOM.—In cut flowers, the amateurs are generally well to the front. This year was no exception, and as in the open class, the quality was very good, Messrs. Jack, and Mr. E. Johnson taking prizes in both classes. "They must be professional amateurs." Mr. Thos. Grimsdale was first with a good collection of 18 Annuals, and Mrs. Jack with 18 Perennials and Biennials, Mr. D. Williamson had the best Dahlias, Pansies and Gladioli, the latter being very fine spikes. Mr. Thos. Grimsdale again took the lead with Basket Vase of cut flowers, also in fruits and vegetables. Amateurs do not shine in the two latter sections this year.

Special prizes were awarded to Mr. Vincent Meredith for an interesting collection of shrubs' Perennials, and Cannas, and to Mr. Ormston Roy, Mount Royal Cemetery Co., for ornamental plants.

The society varied its juvenile department this year by giving prizes for the best spikes of Gladioli, grown from bulbs supplied by the society, to the children, and certainly a more effective display was made than when plants were shown.

ALEX. GIBB.

A MATTER OF VITAL IMPORTANCE.

The operation of various causes, such as the massing of crops in comparatively limited areas, increased facilities for transport, &c., has resulted in the enormous increase of insect pests and fungus diseases of crops, which like the rain, fall on the fields of both the just and of the unjust, taking possession of the farmer's crops and too often gathering the lion share of the harvest. Indeed,

none of the changes resulting from modern civilization is more remarkable than the increasing difficulty in preserving crops from the ravages of natural enemies. Happily, our knowledge of means of controlling the pests is rapidly increasing, the progress made in this direction during the last 15 years or so being little short of marvellous; and, equally happily, farmers are generally recognising that the fighting of the insects and diseases which absorb the vitality of their plants is just as important as the growing of the plants themselves. In all plant diseases the great point is to apply remedial measures before the trouble has made much headway, as some insects and diseases spread with almost incredible rapidity. This naturally brings us to the question of identification of pests of one kind and another—a subject on which we have to say a few words. Amongst the many hundreds of crop disease specimens reaching us weekly at this season of the year no inconsiderable proportion arrive in a crushed and useless condition. Now the actual labour involved in some intricate determinations is great, and we need hardly add that badly crushed specimens increase this manifold, while in thousands of cases we are obliged to write specially to ask for fresh specimens, as the ones previously sent are totally worthless. Not only does this mean extra trouble, but it means delay, which may result in the loss of the affected crop. All this would be prevented if farmers would very kindly pack specimens safely in boxes which would not be crushed in transit to us. For small specimens tobacco boxes are specially suitable. We consider it a special and pleasant privilege to freely identify all diseases of plants and to give the most up-to-date information as to their remedy and prevention in the future, and the correspondents who comply with our wish as regards packing their specimens may always rely on receiving a fully-detailed reply by return of post.

We very constantly have to recommend one of the standard insecticides or fungicides, such as Paris Green or Bordeaux Mixture, and we are therefore giving particulars of the most commonly employed ones, in the hope that farmers will keep this article by them for reference and thus save us time which, in the aggregate, amounts to a very serious matter. Several times recently we have given details of the preparation of various of these remedies, but in no case have they all been collected into one article as in this case. The

methods of preparation are not in all cases quite the usual ones, but they are those which our extensive experience with the preparations has proved to be the most convenient and simple.

PARIS GREEN.

This is a chemical compound of arsenic, copper, and acetic acid. It is a heavy powder rapidly sinking in water. Spraying is the only practicable method of applying Paris green, which may be used at strength of 1 lb of poison to from 150 to 300 gallons of water. The requisite quantity of poison is weighed out and mixed in to a thin paste with at least its own bulk of quicklime which prevents scorching by taking up the free arsenic. The paste is then carefully strained into water, any lumps being broken up and washed through the meshes of the strainer. The mixture should be kept stirred while in use, as the heavy particles of Paris green soon sink to the bottom of the water if left undisturbed. This insecticide is, of course, very poisonous, but its use is not dangerous if proper precautions are observed. No risk is incurred by stock feeding under sprayed trees, and the poison disappears from sprayed plants in from 20 to 25 days after spraying. It is occasionally desirable to economise labour by applying a combined insecticide and fungicide, and in such cases Bordeaux mixture is used instead of water to mix with the Paris green.

BORDEAUX MIXTURE.

The normal Bordeaux Mixture is prepared from 6 lbs. of copper sulphate, 4 lbs. quicklime, and 50 gallons of water. Pour 25 gallons of water into a clean barrel, and suspend in it just under the surface of the water 6 lbs. of powdered copper sulfate tied in a piece of coarse gunny sack or similar material. In another clean receptacle slake 4 lbs. of fresh quicklime, being careful to obtain a smooth paste free from lumps. To effect this a quart of soft water is placed on the lime, another quart or more being added when the lime begins to crack and crumble and the water to disappear. If water be thus added very carefully, and without allowing the lime to become dry, the paste resulting will be perfectly smooth. The lime solution is diluted to 25 gallons with additional water. When the lime solution is cool and the copper sulphate is entirely dissolved both the solutions are thoroughly stirred and then poured together into a barrel holding 50 gallons. The mixture should then be stirred during application, and it

should not be used on fruit crops for a month before picking, as traces of it remain for some time. Bordeaux mixture does not retain its fungicidal value for long after being mixed, though separate stock mixtures of the sulphate of copper and lime last well for an indefinite time.

KEROSENE OR PARAFFIN EMULSION.

The Hubberd-Riley Emulsion is perhaps the most commonly used. The necessary ingredients are two gallons of paraffin $\frac{1}{2}$ lb. fish-oil soap or 1 quart of soft soap, and 1 gallon of soft water. The soap is cut into shaving and is then dissolved in boiling water, which is quickly moved away from the fire and added while still boiling to the paraffin. The whole mixture is then churned violently to and fro with a syringe drawing up a portion of it and immediately forcing it violently back into the vessel for from three to five minutes, when the emulsion should be perfect, and should have assumed the consistency of cream. Rain-water is desirable, as hard water does not make a permanent emulsion. When soft water is not available an excellent emulsion may be made with two gallons of paraffin and one gallon of sour milk. These liquids are churned in the way previously recommended, but without heating, and the emulsion is perfect when the mixture becomes of a thick, buttery consistency. Emulsions made with sour milk must be kept in air-tight bottles if not used at once, to prevent fermentation. In summer applications for aphides and other soft-bodied insects paraffin emulsions are diluted before use with from 15 to 20 parts of water, and for scale insects, caterpillars, grubs, &c., with from 7 to 9 part of water. Stronger washes of emulsion for scale insects, &c., may be safely sprayed or sponged on dormant trees in winter, but such treatment should always be followed by a spring application to destroy the young then hatched.

AMMONIACAL SOLUTION OF COPPER CARBONATE.

This clear fungicide is prepared from 5 ounces of copper carbonate, 3 pints of ammonia 26 per cent and 50 gallons of water. The copper carbonate is made into a paste with a little water in a wooden pail, and the ammonia is then poured on and stirred until all the copper is dissolved. If three pints of ammonia prove insufficient to dissolve the whole of the copper carbonate add more until no sediment. It can be easily sprayed, and though its efficacy is second only to that of

Bordeaux mixture it does not leave any conspicuous stains on fruits, &c.

HELLEBORE.

One ounce of fresh white hellebore, that is of the ground roots, is added to three gallons of water. Apply when thoroughly mixed. This poison is not so energetic as Paris green, and may be used a short time before the sprayed portion of the crop matures.

The Dairy.

COMPETITION OF DAIRY-PRODUCTS
HELD AT MONTREAL, SEPT-
EMBER 8th, 1900.

List of winning competitors.

CHEESE.

M. Ephrem Lizée, Marblaton, Richmond, 93½ marks, diploma of the second class, bronze medal, and \$2.00 in money.

Judges : { J. A. Plamondon,
A. J. Ayer,
E. A. Brice.

BUTTER

M. Clovis Lemay, Ste-Hénédine, Dorchester, 94 marks, second class diploma bronze-medal, \$3.00 in money.

Mr. H. Allen, Foster, Brome, 94 marks, second class diploma, bronze-medal, and \$3 00 in money.

M. Ernest Dubé, L'Assomption, 93½ marks, second class diploma, bronze-medal and \$2.00 in money.

Judges : { J. D. Leclair.
A. A. Ayer.
E. A. Brice.

CHEDDAR CHEESE.

(Continued.)

The Influence of the Scald on Acidity.—Up to the time of cutting the curd, the acidity present in the milk and whey, as already described, is due mainly to acid salts.

The subsequent production of acidity in the whey and curd will be due to the growth of a certain organism or bacterium, to be described more fully in a subsequent portion of this report, but which is known as the bacillus acidi lactici.

organism feeds upon the sugar of the milk, and in so doing converts it into lactic acid. Now both lactic acid and heat have the power of contracting the curd, rendering it firm, and expelling from it that liquid which is known as whey. When the milk sets the bacteria are cut in the curd, and only comparatively few escape in the whey. Thus it is that the formation of acidity, during cheese-making, is taking place mainly in the liquid within the curd, and not in the liquid surrounding the curd. This is well shown by comparing the acidity of the whey surrounding the curd (Col. 34) with the liquid which drains from within the curds when this is piled (Col. 35). This fact has many important bearings upon the manipulations of cheese-making, and is the one which more than any other gives rise to the various systems of cheese-making which exist.

If then the temperature of the scald be low, say, 94° F., the contraction of the curd due to heat is comparatively slight, and whatever contraction takes place is mainly due to the formation of acid within the curd, and the contracting power which it exerts. But if the temperature is higher, then the contracting power of heat comes into play side by side with that of acidity and exerting more and more influence the higher the temperature until; with a scald temperature of 105° F., it is possible to obtain the curd in a sufficiently "shotty" condition to be fit for the whey to be drawn off without any material increase in the acidity. True, the greater heat of this scald is slightly more favourable to the rapid growth of the bacillus acidilactici, but, on the other hand, the contraction of the curd withdraws from the curd the way containing on which the bacilli feed, and it will always be found that the less whey there is in the curd the slower will be the production of acidity. For this reason, a wet curd is one which may become very rapidly acid, hence the origin of what will be found in the description of the Cannon system of cheese-making in a subsequent portion of this report as a soft acid curd.

The Development of Acidity in the liquid in Curd.—

From the time that the whey is drawn off the acidity develops within the curd only, and the quantity of acid has been estimated in the liquid which drains from the curd during each subsequent process to which it is subjected. The drainings from each stage were collected separately, and the results of the acidity determinations are given in the tables in Cols. 39-45. The development of

acidity during these stages depends upon several factors, first and principally, on the number of bacteria present in the curd when taken from the tub, secondly, on the heat of the curd and whether this heat is maintained or not, thirdly, on the moisture in the curd, and lastly, on the amount of air which is allowed to get to the curd during the operations. Thus it is that, while on one day the curd is fit to be ground, there having been already developed sufficient acidity, after the first or second cutting, and quite early in the afternoon, on other days it is not fit to grind, owing to the absence of acidity, until it has been cut twice and turned four or five times at intervals of about one hour, so that it is not ready to be ground until late at night.

In the manufacture of a Cheddar Cheese the greatest difficulty which the maker had to contend with, before the introduction of the means of estimating acidity, was to determine when the curd was fit to grind. If the curd is ground before sufficient acidity is developed, then the cheese does not ripen properly, and often puffs up and is blown. On the other hand, if too much acidity is developed, the cheese ripens too rapidly, if too acid when it should be ripe, and will sometimes run wet in the cheese room or crack and afford a lodging for the cheese fly. Prior to the introduction of the acidimeter, the cheese-maker had to depend upon the taste, appearance, and texture of the curd to determine when it was fit to grind. My investigations soon convinced me that the amount of acid present in the whey which drains from the curd, when in the cooler, was an accurate indication of the fitness of the curd for grinding. In order to fix a standard for this acid, the average acidity of the liquid from the curd immediately preceding grinding has therefore been calculated, and the results are given in Col. 45a.

Now arises the most important question. What should this acidity be. As the acidity which will control the cheese is indicated by the liquid from press, the cheese-maker must first determine what the acidity of that liquid should be. Then, making allowance for the rise or fall in acidity which will take place during grinding, vatting, and pressing the curd, he will be able to estimate what acidity the liquid which drains from the curd when on cooler should show immediately before that curd is ground.

The acidity of the liquid from press.—If we can determine what amount of acidity is requisite in the

liquid from the press, we shall have a standard for the liquid from the curd when this curd is fit to be ground. Our chief consideration in fixing this standard will be the time in which we desire the cheese to be ripe. If we wish a slow ripening cheese then the acidity must be lower, if a very quick ripening cheese, higher, than our ordinary standard.

Another consideration of importance is the fact that an acidity in the liquid from press which, at one school, or at one time of the year, has given an excellent cheese, at another school or even at the same school, but at a different period of the season, has given either a too acid cheese or one showing a deficiency of acidity. This subject has been one of considerable difficulty to explain, but, after a very careful study of all the facts, it would seem to be due to the varying quality of the milk. Where the milk from which the cheese was made has shown a high proportion of acidity, there a cheese made with a high acidity in the liquid from press has been excellent. But if from a milk with a low acidity a cheese is made having a high proportion of acid in the liquid from the press, this cheese will, at the end of three months, which may be taken as the average time of ripening for cheese made on the Canxon system, be found to be too acid. I have carefully studied the results of the eight years' work as regards the acidity of the milk, and of the liquid from press, side by side with the opinions of the cheese-buyer upon the various cheeses, and it appears to me that the amount of acid required in the liquid from press must depend entirely upon the original acidity of the milk. For a cheese of fairly rapid ripening quality, the liquid from press must contain five times the acidity of the original milk. Thus, while on one farm, where the milk shows 0.18 per cent of acid when brought into the dairy, the acidity of the liquid from press may be taken as .90; on another, where the acidity of the milk is .20, the acidity of the liquid from press should be 1.00 per cent, and in the autumn, or at a farm such as Vallie, when the milk shows an acidity of .22 per cent, the liquid from press may contain 1.10 per cent of acid.

There are certain to be conditions on some farms which may necessitate some slight variation from this standard, apart from the variation which will be necessary for a slower ripening cheese. Those cheese-makers who are using the acidity apparatus as a guide in their cheese-making would

do well to bear these facts in mind. This standard for the acidity of the liquid from press also presupposes that the curd is sufficiently dry. (See *Moisture in Curd*). If the curd is moist, then the standard of acidity will be too high. Acid cheeses are nearly always the result of a moist curd and high acidity in liquid from press.

Acidity going back.—Frequently during the months of August, September, and October the acidity of the liquid from the press is less than the acidity of the last drainings from the curd when on the cooler. It has been noticed on isolated occasions in most years, but never to such an extent as to affect the averages, until 1898. It is invariably associated with a faecal taint in the curd, so that it is probably the result of bacterial changes. Its practical importance is this, that when such taint arises it is necessary to develop in the curd before vatting more acidity than is desired in the liquid from the press, otherwise the cheese will be tainted and inferior.

The influence of salt on acidity.—It is a common belief among cheese-makers that the salting of the curd checks the formation of acidity. This supposition is entirely erroneous, so far as my experience goes. Indeed, so necessary is salt for the growth of bacteria, that it is one of the substances which must be placed in all artificial nutriment prepared for their growth.

A study of the tables shows that even during the addition of salt and the placing of the curd in the vat, the formation of acidity has been still going on, so that the liquid which comes away from the press is more acid than the last drainings from the curd before grinding.

Tests were made of the liquid from press immediately pressure was placed on the cheese, and the average acidity of the liquid was found to be 1.075 per cent, while the liquid coming away half an hour afterwards had an average acidity of 1.088 per cent.

However, with the idea that it would be of more practical value to make a distinct experiment upon this point, and record the result, the following course was adopted. On the 6th of June, 1895, the curd was salted and divided into two portions, one was vatted immediately after salting, the other spread out the cool, and left for three-quarters of an hour before vatting. The acidity of the draining before grinding was .91 per cent. The acidity of the liquid from the press of the portion vatted immediately after grinding was

1.08 per cent., while that of the portion which was allowed to stand for three-quarters of an hour was 1.22 per cent. The portion vatted immediately was at a temperature of 76° Fahr., that vatted after standing three-quarters of an hour was 72° Fahr. The acidity of the liquid from the press of the portion first vatted was again taken when the second portion was vatted, or three-quarters of an hour after it had been in the press. It was then found to be 1.14 per cent. It will thus be seen that the salt did not retard the formation of acid in either portion. The formation of acid was more rapid in the portion exposed to the air than in the portion placed in the press, even though the latter was 4° Fahr. higher in temperature.

This experiment proves beyond doubt that salt does not stop nor even retard the formation of acid in the curd. It also shows why, in those methods of cheese-making in which the curd is spread out to cool before being vatted, it is not necessary to produce so much acidity in the earlier stages as is essential when the curd is vatted immediately after being ground.

CHEDDAR CHEESE.

The Minister of Agriculture for the Province of Quebec, Canada, has recently been examining into the manufacture of cheese in the Province. Believing that there were certain defects in the method of manufacture now followed in the Province, he has referred the matter to a Special Commission. After carrying out certain experiments in Quebec, the manufacturer and chemist in charge of the investigation have come to England to seek the co-operation and assistance of Mr F. J. Lloyd, whose "Report on the manufacture of Cheddar Cheese," recently published by the board of Agriculture, had attracted the attention of the Minister of Agriculture for Quebec. Mr E. Bourbeau, and Mr. G. Henry, who are carrying out this inquiry, have paid a visit of several days' duration to the Cheese School of the Bath and West of England Society, where they have had the double advantage of not only seeing the cheese made by the Instructor, Miss Cannon, but of meeting Mrs. Sage, who, as the previous teacher of the school, carried out all the practical part of the many investigations made by Mr Lloyd between 1890 and 1898. Messrs. Bourbeau and Henry have also visited Mr Jas. McAdam at Castle Dou-

glas, who is pre-eminent at a maker of Scotch Cheddar; Mr McAdam's system is similar in the main to that used in Canada, but has been greatly modified as a result of the exceptional experience, skill, and study which he has devoted to this industry. By the changes which have been so introduced, an attempt has been made to overcome some of the defects of the Canadian system, and the Commissioners were keenly interested in both the operations and conversation of their genial host.

Messrs. Bourbeau and Henry will remain in England for some time in order to complete their investigations. Among other things they are remaining to examine some experimental cheeses made by them in Canada before they left, and which are expected to arrive in England shortly. This enterprising action on the part of the Province of Quebec shows how keen is the desire of our Colonies to take every step that may lead to progress, and there can be no doubt that the cheese-makers of the Province will reap a rich reward. That cheese can ever hope to compete (1) with the best home-made article is not probable, but that it may take the first place among imported cheese is possible and not unlikely.

Eng. Ag. Gazette.

EXPERIMENTS WITH MILK PRESERVATIVES.

The London *Lancet* gives the following account of some experiments with milk preservatives.

Five kittens were fed on milk containing 80 grains of boric acid per gallon (equal to 1.7 of 1-100). In four weeks all were dead. Five kittens were fed on milk containing 40 grains per gallon; two died in the third week, and the rest in the fourth. Five control kittens received pure milk, none died. The diminution in weight in the animals receiving the boric acid milk was very marked and brought into significant relief by comparison with the increase in weight in those fed on the normal fluid. It was seen, in a day or two, that the kittens treated with the boric milk were losing appetite. Diarrhoea, inactivity and depression followed, then rapid emaciation and death.

With milk containing formalin similar results were obtained. Of five kittens treated with milk containing one part formaldehyde in 50,000 of milk, three died in five weeks; the average increase in weight was 177.6 grammes, compared with

(1) Not the same old pastures. Ed.

251.1 grammes of four control kittens treated with normal milk; with milk containing 1-25,000 of formaldehyde, another series showed an average gain of 196.6 grammes as against 325.7 grammes gain by kittens fed on normal milk. Of a third lot treated with milk containing one part of formaldehyde in 12,500 of milk, two died in the fourth week; the average gain in weight was only 96.4 grammes against 312.5 grammes with the "controls" fed on normal milk. The younger the animals were, the more susceptible they appeared to the influence of the formalin. The experiments are only preliminary, but the fact cannot be denied that they have a very distinct bearing on a matter which is, literally, of vital importance.

If kittens cannot stand such poisoning, what chance is there for human babies?

The above is worthy of attention. There is a great deal too much poison about nowadays. Ed.

CRITICAL TIME OF THE YEAR.

Dairymen Should Prepare to Keep Up Milk Flow.

A. L. Hacker of Lincoln, Neb., Experiment Station has, in *Nebraska Dairymen*, the following:

This is a critical time of the year for the dairyman, as there are so many forces at work reducing the milk flow of his dairy cows, and these same forces are hard ones to cope with.

Now is the time when pastures start to fail, and the cows will go hungry rather than graze the dry, unpalatable grass, while the heat and flies keep them most uncomfortable.

The cow that shrinks in her milk during the next two months will not be a profitable dairy cow in the fall and early winter, as it is next to impossible to bring a cow back to normal flow after she has once started to go dry. Here is one of the secrets of successful dairying and the reason why some herds produce double what others do.

This is a season when good dairy herds are made unprofitable and dairymen lose their patience and go out of the business. To keep your cows well fed it is often necessary to have some green feed to take the place of the failing pasture.

A small field of succulent forage at this season of the year is a valuable crop for the dairyman—sorghum cane, cow peas, milomaize and kafir corn all do well in eastern Nebraska and make excellent substitutes for summer pasture.

The cows can be turned on the forage during the day time when the flies are bad, and the tall stalks and leaves will serve as brushes in keeping the flies from their legs and sides. Then in the night they may be kept in the old pasture, and they will eat the short, dry grass better when it is covered with dew.

Green corn or sorghum cut and fed in the pasture will greatly help to keep up the milk flow, as it will be greedily eaten by the cows, who are longing for a change in food, especially for something green and succulent.

BEST TEMPERATURE FOR CREAM RIPENING.

Experiments show that the bacteria or organisms which produce the ripening of cream are most active at a temperature of about 970 or 980 Fahr., or in other words about human blood-heat. Cream kept at such a temperature will very rapidly ripen and be fit for churning in about half the time that would be required to sufficiently ripen cream of a similar quality kept at a temperature of 20 or 30 degrees lower. In experience, however, it is found that the ripening of cream at such a high temperature is not conducive to the production of butte of good quality. In order to produce the all essential nutty flavour which is so characteristic of the best butter it is found necessary to allow the organisms to develop slowly and gradually, and it has now been established that the best temperature for doing so are about 57 to 58 degrees in warm summer weather, and from 60 to 61 degrees in cold weather in winter.

TESTING THE RIPENESS OF CREAM.

Cream, we are told, should be allowed to reach the proper stage of ripeness before churning, but it is not always that the dairy maid is in a position to know exactly when the proper degree of ripeness has been reached. Experienced hands can, of course, always tell, by merely testing the cream, when it has reached the proper degree of ripeness, but, unfortunately, all butter makers are not experienced. It is useful therefore to know that even "novices" can always count upon being easily able to ascertain the proper degree of ripeness in cream by the use of ordinary litmus paper. When a piece of blue litmus paper is dipped into sufficiently ripened cream, it will be

found to at once turn a pinkish red color; if it does not immediately change its color after being withdrawn it may be taken for granted that the proper degree of ripeness or acidity has not been developed.

Live-Stock.

SHEEP SHEARING BY STEAM.

The modern tendency to trim closer in every line of business has at last overtaken the poor sheep, and hereafter the simile, "as a shorn lamb" should be revised to read, "machine shorn." During all these years of head and horse clipping by the "mower," the sheep shearer has managed to hold his own with the venerable spring back shears; and even now, so far as speed is concerned, the professional hand sheep-shearer yields little, if any, to the machine. For all that the machine has come to stay; not only because it saves time on a large flock, but because it saves about as much wool as pays the man who clips.

On a first-class plant ten machines are run at a time, but each can be started and stopped at will. The shears are very like a barber's "clipper," but with teeth three times as large, and they cut a swath about two and one half inches wide. The power is furnished by a gasoline engine.

An operator hauls forth a fresh sheep, seats the animal between his legs, and while the left hand grasps his muzzle, the right hand guides the shears straight down the stomach from a point midway between the front legs. The sheep hold these two front-paws with truly feminine grace. Back go the shears for another swath. The stomach bared by some four strokes of the shears, that big tail is stripped so that it looks like a peeled banana. One stroke cleans the wool from inside each hind leg; then the outside of the left hind leg is finished, and swift strokes of the shears have laid bare the flank up to the neck. This operation makes the sheep look very much like a blood orange peeled by a sharp knife; for, the red flesh shows pink through the white skin, while here and there a hasty stroke has left a yellowish rise of wool-like so much pulp on the orange. Having shorn the head, the man works back the reverse way, flops over the sheep, and finishes exactly where he began.

R. M. Marquis of Mirabel, Mo., is said to have

sheared 275 sheep in 12 hours. That would allow him a trifle over two minutes and one-half per sheep, making no allowance for changing animals or renewing dull shear blades.—*N. W. Farmer.*

SHEEP STATISTICS.

The loss of 646,528 sheep in Great Britain, revealed in the Agricultural returns issued by the Board of Agriculture on Tuesday last, is disappointing, though it cannot be said to be altogether unexpected. The effect is to sweep away the gain made on the last two years, and to place the flocks of the country at about the same level as in 1897. The most unsatisfactory feature, perhaps, is the check which appears to have been given to the slow but steady augmentation of the number of ewes for breeding which has marked each of the five years immediately preceding. The loss of ewes is only 1 per cent., the total being still considerably more than in 1898, and the largest decrease is in the number of lambs, of which nearly half a million less were enumerated last June than a year previously. For the first time since these returns were separately given, the number of lambs were returned as less than the number of ewes. This may be due to one or two causes—to a smaller crop of lambs, a greater mortality among them, or the early marketing of a larger number. Possibly all three causes may have operated to some extent. The reduction of 13 per cent. in the number of sheep other than breeding ewes and lambs is not very material in itself, but it follows a loss of just double the relative extent in the preceding year.

HAMPSHIRE DOWNS.

Professor Wrightson writes:

"I am a ram breeder, and bring out my lambs in August, I hope, as well as my brother breeders. Our system is peculiar. We lamb in January as far as possible, and our lambs are well kept from birth, and have changes of food. Such lambs have linseed cake, peas, beans, &c., and have turnips, green rye, winter barley, trifolium, vetches, rape, cabbage, clover heads, all in succession, and often two baits a day, as well as outruns on clover and sainfoin. It is a thorough system, and cannot be compared at all with open grazing. The Hampshire breed of sheep is wonderful as regards

early maturity, and at Salisbury Fair we shall see lambs I should judge to be 25 lb. per quarter on July 15th. There is always a great competition at this fair; and pens of eight will be exhibited of the finest type from the best flocks. On the other hand, lambs ordinarily kept will not fetch more than from 30s. to 36s per head in most years at the same date, and there will be plenty at lower figures unless very high prices rule.

As to phosphatic manures, I cannot see that they can injure the sheep, but we generally manure our land through feeding rather than by heavy manuring.—*Eng. Ag. Gazette*

A fair weight for a lamb, 100 lbs. of carcase! We hope Mr James Cochrane will see this extract. Ed.

RECORD PRICES FOR THOROUGHBREDS.

Summing up the results of the recent sale of the late Duke of Westminster's yearling Thoroughbreds, the Breeders' Gazette says:—

"America no longer holds the record for the largest price paid for a Thoroughbred yearling. Formerly the \$40,000 paid for King Thomas in New-York stood at the top, but England has of late beaten that figure twice. It was supposed for some little time previous to the sale that the yearlings owned by the estate of the late Duke of Westminster would provoke the keenest competition and reach far up in the price scale, but no one suspected that such tremendous figures would rule. The twelve head exposed for sale realized no less than 216,500, or an average of upwards of 18,000. Never was such an aggregate received for a band of Thoroughbred yearlings. Mr J. S. Sevier had apparently made up his mind to take some of the highest priced ones back to France with him, for a few days before the sale he deposited \$100,000 in the Bank of England and he bid on every lot sold. For the bay filly by Persimmon (the Prince of Wales) first Derby winner, out of Ornament, he paid \$50,000 and he made the present Duke of Westminster pay \$45,000 for the bay colt by Orme out of Kissing Crust. He secured the bay colt by Orme out of Gauntlet for \$28,000 and the bay filly by the Australian sire Trenton out of Sandiway for \$27,500. Then he forced the present Duke to pay \$28,500 for the colt by Orme out of Vampire and \$12,000 for the grey colt by Grey Leg out of Ruth, by Scottish Chief. For the chestnut colt by Orme out of Throstle—one of the most beautifully bred Thoroughbreds in exist-

tence—he paid \$7,500 four of the yearlings thus falling to his bids. The young Duke got one more, including the full brother to flying Fox, by Orme out of Vampire, by Galopin. The sale at Newmarket during the week in which these yearlings was sold was full of sensational interest. Six mares that were owned by the late Duke of Westminster were among the general offerings and they averaged \$5,500. The stallion Grey Leg went to Germany at \$13,000, for the Imperial stud. Mr Sevier paid \$15,000 for the brood mare Astrology and 6,500 for St. Illma, while the Duc de Gramont also took to France a lot of five that included a four year old purchase at \$15,500. Foxall Keens bought for exportation to the United States the brood mare Sandfly at 11,000 and another mare, Strawberry Hill, by Hampton, was bought at 10,000 with the same destination. Altogether it was a great week."

THE HOG.

The U. S. raise about 56 per cent of all the hogs in the world. The statistical department shows over 122,000,000 in the world, of which the States produce 69,000,000. Corn is the main source of this immense pork production. Though corn is a very unsuitable feed for growing pigs, it lays on fat more cheaply than any other kind of food.

England is now receiving each day not less than 2,300 tons of dead meats from foreign countries. Improved processes of handling meats have made the meat of all the faraway countries tributary to her markets. Sheep and cattle in Argentina which but a few years ago were slaughtered by the million for their hides and tallow, are now artistically dressed and delivered by thousands of tons on the London markets.

(And yet, while the bacon from the U. S. sells in the London market far from from 44s to 48s., Canadian bacon fetches from 56s to 60s. Ed).

WHITE SCOUR IN CALVES.

This disease (says a leaflet issued by the Irish Department of Agriculture and Technical Instruction), is, unfortunately, so well known that description is scarcely needed. It is a form of gastro-enteritis, and is akin to a fatal disease of children that is common where the vessels containing children's food are not kept in a clean

condition. The disease is believed by some to be caused by a minute organism found in milk kept in dirty vessels, or that has been milked from cows whose udders are dirty from the cows having lain in dirty places, or through their standing in dirty ponds. Calves are rendered more susceptible to the disease either by being crowded together in dirty houses where they can suck one another or by being fed in an irregular manner. Giving skim milk or separated milk at too early an age; allowing the calves to remain too long fasting; giving large quantities of skim and separated milk, unmixed with linseed or other similar ingredients, at one time, are all dangerous as making the young calf more liable to diseases of digestion.

The best way to keep calves healthy is to keep their houses clean and well drained. The bedding should be dry and the soiled litter should be removed every day from the houses. In some cases calves are kept singly in pens, and fresh straw is supplied for bedding each day. The cleansing and disinfecting of calves' houses at the commencement of the season is most desirable. After the house is thoroughly cleansed a disinfectant should be sprinkled over the floors. Carbolic acid diluted with water will suit for this. Should the disease break out the calves must be at once removed to another clean house, and the apartment where they had been should be thoroughly cleansed and disinfected.

Disinfection of the premises in which the calves are kept is most easily and effectively done by sulphur fumes or by chlorine fumes. Having securely closed all openings, place in the centre of the apartment to be disinfected, a vessel containing burning coals or turf. Upon the fire put a quantity of "cane brimstone," 2 to 10 lbs., according to the size of the apartment. When the sulphur has lighted leave the place quickly, as sulphur fumes are unpleasant and dangerous. Close the door, and paste paper around the edges in order to keep the fumes inside. The effectiveness of disinfecting with sulphur or chlorine fumes depends upon keeping as large a quantity as possible in the apartment. Chlorine gas is a thorough disinfectant when it is properly applied, but it is more troublesome than sulphur. It is prepared by pouring muriatic acid into an earthenware vessel containing chlorate of potash. The vessel must be kept at a height in the apartment, as the gas that will be given off is heavier than

the air and will fall towards the floor. The apartment must be kept as nearly air-tight as possible to secure thorough disinfection.

Calves should have the first milk (biestings). This is absolutely necessary for the future health of the animal. (1) If the cow is not allowed to lick the calf, a smart rubbing with a straw wisp should be given to the young animal. The rubbing sets up a healthy action in the skin and muscles. After a couple of hours the calf may be allowed to suck the cow, whose udder should be clean; or it should be fed with a small quantity of the biestings taken direct from the cow. The calf may get about one pint of biestings five times a day during two days. Afterwards, for a fortnight, the calf should be fed four times a day with new milk, commencing with one pint at each meal, increasing the quantity gradually. After a fortnight a mixture of one-third skim milk or separated milk, with new milk, may be given, and the quantity of skim or separated milk may be increased until the calf is a month old, when the giving of new milk may be discontinued. "Flaxseed jelly," made by boiling crushed flaxseed in water, is a good addition to separated milk, when the new milk is withdrawn. This may be given for a fortnight or three weeks after the calf is put on separated milk. About half a pound a day is a ration.

As to the important question whether cakes or meals of various kinds should be given to calves raw or cooked, the results of experiments show that, on the whole, calves will thrive best on a diet of dry meals or cakes, when their principal food is skimmed or separated milk. From an early age a little sweet hay should be available for calves when they are housed. This is necessary, as the rumination ("chewing the cud") commences with calves at an age earlier than is generally supposed. Stomach derangement may take place if coarse straw or other food difficult of digestion is eaten when calves are very young.

As soon as the weather becomes fine calves should be allowed to be as much in the open air as possible. They will soon commence to eat grass. Precaution against their sucking each other should be taken. The American nose-gag appears to be the best method for securing this object. Its use does not prevent the young animal from grazing. The use of separated or skim milk may

(1) No; for it agglutinates the hair of the calf. Simply cover the calf with lots of soft straw. Ed.

be continued until the calf is four months old, or longer if a more profitable method of using the milk is not available. In all cases separated milk should be used sweet, and as fresh as possible from the separator. It is well to remember that cleanliness in the calves' houses, cleanliness in the vessels in which milk is kept, and cleanliness in the methods of calf feeding are essential. Feed frequently with moderate quantities of food, and have everything connected with the feeding kept scrupulously clean.

The Poultry-Yard.

(CONDUCTED BY S. J. ANDRES).

THE HEN OUT OF SEASON.

It is doubtful if its pays to attempt to hatch and raise chicks with hens during the winter season. In the first place, the hen has a will of her own, and does not become broody just at the time most desired.. Hens in winter labor under many disadvantages, and cannot undertake the task of hatching a brood except at a risk to themselves. The principal obstacle is the attention required for a hen are than for the chicks, as she is compelled not only to keep warm herself but also to protect her brood. The cost of the food for the hen is also an item, as well as the time lost in not laying. If a number of hens become broody about the same time the cost of the chicks will be much less than when there are only two or three broods, as it requires but little more labor, as well as time bestowed, than for a few. The difficulty is that, as the chicks grow, the space covered by the hen when she is hovering the chicks at night becomes smaller, and some of them consequently become chilled and droop. Hatching with hens in winter should not be attempted without the aid of comfortable coops and runs, which should be under shelter.

THE CURING OF CLOVER HAY FOR POULTRY.

The use of clover hay for poultry has become so popular among poultrymen that I have corresponded with parties who have been using it for years with great success and good results in the

production of eggs in winter. I presented to our readers the following method used by a large breeder of poultry. I give it in his words : "The first thing is to get a field of second crop of clover that is about three or four inches high. Mow it early in the morning, directly after the the dew dries and let it lay until the evening ; turn it over two or three times during the day.

"Gather it up in the evening and either place it in a small stack, covering it up so the dew will not be allowed to fall upon it or place it in some shed or barns.

"Dry it thoroughly by spreading it in some good place where the sun will strike it. Continue this about three days, until you are positive it is thoroughly cured then place it in the barn. Put it in a stack for about twenty-four hours and you will find it will begin to sweat ; turn it over, shaking it up, then allow it to lie about twenty-four hours longer, spread out and let it thoroughly dry. Than run it through a clover-cutter, cutting it from one-eight to one-quarter of an inch long. After you have cut it let it lie in a pile and examine it occasionally for about thirty-six hours, to see if you find any sweat on it whatever and if you do you must spread it out and dry it again.

"Never allow clover that you are curing to get wet by rain after you have it cut. If you find there is no sweat whatever on it after examining it, you can barrel it up or put it in sacks. You can keep it for two years without it becoming musty or mouldy. In feeding it to your chickens, it should be scalded, or in other words steamed, and it will have the same effect as feeding newly cut clover to them."

Some of our readers may think this method too tedious and troublesome and not worth the labor, but I can assure them that it is a matter which has been talked about and written about and repeatedly questions have appeared in the poultry journals asking how it can be done. The trouble appears to have been that those who have tried to cure it say it would not keep sweet and clean without mildewing and therefore offensive to their birds. But as it only requires a moderate quantity for each flock and the result of feeding clover hay to poultry so satisfactory that I know from personal experience it will be well worth the trouble to prepare each season a good quantity for the birds to use as a bulky food in winter and reduce the grain bill which is a considerable item

in the production of eggs. A good way to feed it is to make it up into small bundles tying it in the middle with twine and hang it up from the ceiling of the poultry house just high enough so they will have to jump a little to reach it therefore giving exercise as well as food taking together, a thing which should be required of all flocks of laying hens, large or small. Just watch your birds after they have been shut up in the winter for a while and you will be astonished and amused to see them eat a bundle of clover so that not a leaf will be wasted. It has become so popular that it has become a staple article of merchandise both in bulk and being ground into meal by a patent process and sold at good prices and it seems to me that if properly cured and compressed in small cake something in the same way that hay is being done for the army. It would be another source of revenue to the farmers of this country and find a market in England as well as in the N. S. Why not? Let some enterprising farmer take it in hand and try it in a small way to start with. Try it and if at first you do not succeed, try again.

S. J. ANDRES.

POULTRY ON THE FARM.

Poultry on the farm never received so much attention as is now being given to it. Not very long ago the farmers who paid particular attention to poultry were looked upon as being "cranks" and wasting a lot of time that women should be allowed to attend to.

These men were wiser than their neighbors thought them and were ahead of their generation and to such men the poultry industry owe much of its success. They built good houses, and took care of their stock and the chicks provided proper food and made money out of their flocks, and others becoming convinced that it paid to take of their hens followed suit and the result is that the men who neglects the hen are those who comes under the ban and create remarks upon themselves by these same neighbors. There is no doubt that hens helped out many a farmer during the years of depression and close times and now they are more profitable than ever before. It is not necessary that the farmer should start out as a poultry fancier in order to make a success of his poultry, but the one who begins by taking good care of the poultry he already has, will, before very long, be looking after the pure bred stock,

he will desire to be up with the times and reap the greatest profit as the result of his efforts and will soon become convinced that pure bred poultry is superior to any mongrel stock he may already have.

One breed is enough for a farm and when all the hens look alike the flock is much more attractive than it would be if made up of mixed colors.

White Plymouth Rocks, Barred Plymouth Rocks and White Wyandottes are good breeders for the farmers. They are easily bred to uniform color and are the best all round fowls we have. If only keeping one breed my preference is for the cold climate and winters of our Province of Quebec, the White Wyandotte; it is a good sized blocky bird, good layer in winter if the pullets are hatched early. Pullets mature quickly and having low combs, stand the cold better than the largers combed birds.

Brahmas, light and dark, Houdans, Leghorns and Langshans are all good fowls and make good stock for the farmer who gives good care to his flocks particularly in winter. The Houdan is a great favorite with the French people in France for the sake of their flesh as it is very rich in flavor and of nice color. I shall take up the utility breeds in another article soon.

Great stress has been laid upon the breeding of birds for feather; but the breeders of fancy fowls have been gradually forced into breeding for utility the production of both eggs and flesh as some of the best laying breeds have been almost ruined in breeding for points of feather, etc., as I now see in the Black Spanish bred which was known at one time as the best of the Mediterranean class as an egg producer. To day they are going out very fast, and others of their class are taking their place, for instance the Minorcas and Anconas. I am very glad to see that the White Leghorns are coming to the front and bid fair to give their friends in the American class a close run in the race as flesh producers although for many years they have not been considered as being very high in that particular, except in the early broiler stage.

