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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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- THE -

Journal of Agriculture and Horticulture

THE JOURNAL OF AGRICULTURE AND HORTICULTURE is the official organ of the Council of Agriculture of the Province of Quebec. It is issued Bi-monthly and is designed to include not only in name, but in fact, anything concerned with Agriculture and Stock-Raising, Horticulture &c. All matters relating to the reading columns of the Journal must be addressed to Arthur R. Jenner Fust, Editor of the JOURNAL OF AGRICULTURE AND HORTICULTURE, 4 Lincoln Avenue, Montreal. For RATES of advertisements, etc., address the Publishers

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Table of Contents

Notes by the Way.

Tobacco.—We mentioned in our last the enormous falling off in the cultivation of tobacco, as shown by the government returns of last season. Now, as we have been a smoker for more than 60 years, we think we shall not be accused of vanity when we lay claim to the title of a judge of tobacco, and we can most sincerely say that, as long as we can get *good* Canadian tobacco for our pipe, we do not care a fig for all the tobaccoes, however grandly named, that are offered in the shops.

We say "*good* Canadian tobacco," because there is an immense proportion of the weed grown here that is utterly ruined by the grower. Just as the fraudulent orchardist is ruining the export-trade in apples by his dishonest packing, so does the greedy tobacco-grower injure his market by mixing up the immature leaves, that sprout after the main crop is cut, with the well-ripened first crop. Hence comes that *spitting* sound so often heard by the smoker when his pipe is well a light; which sound is invariably accompanied by blistered tongue and lip.

Again, there is the practice too prevalent of allowing the leaves immediately after they are cut to lie in a heap and sweat. The sweating should take place after, not before, the tobacco is dry. The practice we complain of, which is carried out to hasten the drying, invariably produces that abominable *hot* smell that almost all the lower classes of tobacco grown in the renoter districts of this province develop; the odour is unmiskatable; if you hold a pinch of the leaves to your nose, you will perceive it at once.

The business of the grower is to grow the plant, dry it, and pack it: the manufacturer's business

is to complete the work by sweating and compressing the leaves into merchantable shape, with as little addition of flavouring and viscous materials as the market will allow him to employ. If the maker insists upon having the genuine flavour and odour of the pure leaf utterly concealed under spurious adulterants, for the sake of the *chewer*, he might as well let those *smokers*, who know how to distinguish truth from falsehood, enjoy the pure flavour of the unadulterated leaf.

We have smoked all kinds of tobacco, Kanaster, Latakia, Gulf of Salonika, sweet caporal, etc., and we do not hesitate to say that we never smoked any leaf superior to the small Canadian, sown early, transplanted once into cold frames, set out about June 10th, harvested in the first week of September, carefully dried, moderately sweated *after* drying, and kept closely packed until required for use.

And, à propos of tobacco, we may as well mention that a large factory is now being built at Toronto for the preparation of the weed in the different forms in which it is used in Europe and Canada. Orders, it is said, have been already received for upwards of a million pounds. In future, planters will have no difficulty in finding a market for their growth at a fair and reasonable price.

We print, on another page, a translation from the French of M. Ulric Barthe on "The balance of trade." We beg M. Barthe to accept our hearty thanks for his very useful development of the true principles of exchange, namely, that you cannot, as the late John Bright expressed it, pay for your imports except by your exports.

Barley.—In that part of England where we were born and grew to man's estate, namely in the S. Eastern counties, we fancied that we produced the best malting barley in the world, and it was not by careless treatment that we succeeded. Barley, in that region was (and is) sown after roots or rape fed off by sheep. The land was ploughed close after the fold, to cover in the sheep-droppings, and the seed was invariably sown on the stale-furrow, without any more ploughing, the frost, slight as it often is, making a far finer tilth than any amount of the farmer's work can do. As early as possible in the spring the harrows, and perhaps the grubber, went to work, the horses stepping as briskly as possible, and when the land trod as equally under foot as the floor of a carpeted room, the seed was drilled in at the rate of from 2½ to 3 bushels an acre, according to the time or season. Such was the method pursued, and such it is now.

One reason why barley should be sown thickly is, that if it were sown thinly, as some people recommend, a great deal of tillering would take place, and the consequence would be that many small, immature grains would be produced, which would grow irregularly in the maltster's "pieces," and so the whole of the "steep" would not be ready for the "kiln" at the same time.

If the barley is sown very early, we strongly advise farmers to postpone the sowing of grass-seeds in it until the grain is well up There is no use in getting the seeds in too soon; for, if they get too forward they not only rob the barley, just as a lot of weeds do, but they delay the drying of the barley when mown, a matter of more importance than people seem to think it here. Barley, to be worth the highest price to the maltster, must be perfect. There is a vast difference in the English market in the price of barley. We have known good, heavy grinding barley selling for 24 shillings a quarter of 8 bushels, and, on the same day, first-rate malting barley fetch 50 shillings, 108 per cent. more! And this was not so uncommon a fact as it might seem to a careless observer; for a friend of ours saw, one day, in 1854, ten thousand quarters (80,000 bushels) of barley in the granaries of the Saffron Walden maltsters, who worked solely for Alsop's brewery at Burton on Trent, every bushel of which had cost 6s. 3d. ($1.50); and we have by us an extract from the *English Agricultural Gazette*—1890,—which gives the market-prices of barley as follows:

	s.	s.	
Grinding barley.....	20 to	24	a quarter.
Distilling "	25 to	28	"
Malting "	30 to	50	"

With a good judge, weight has not much to do with the value of barley for malting; the grinding qualities very often weighing quite as much as the best samples of malting barley. No one but a maltster can tell wherein the difference lies, but a skilled operator knows at a glance all about it.

The best samples of malting barley, in England, are grown on moderately rich good soils, after roots or rape fed off by sheep; but on very rich land, highly farmed, wheat is taken after roots, and barley follows the wheat.

In 1890, the then Minister of Agriculture imported 12 500 bushels of 2-rowed English barley (at $2 00 a bushel), for seed, to be distributed among our farmers. This with a view to our growing barley for exportation. But we fear the English maltster was not pleased with what we sent over, as we have heard nothing more about it. The Americans will have nothing to do with 2-rowed, and their purchases of the other kind (6-rowed) are very large. In 1862, we imported *Chevalier* (2-rowed) barley for seed from England, and gave it away to the Chambly farmers, thinking to get the crop for use in our own brewery at that place. In three years, it had all run out, the soil or climate not suiting it.

By the bye, we saw the other day that some one had been writing in the papers against the use of *brewers' grains* as a food for milch cows! The letter was evidently from a milk-producer and is not worth the paper on which it was printed. We said enough on this subject in the March No. of the JOURNAL for the year 1896 (p. 308); in which number will also be found the opinion of Dr. McEachram, F.V.C., and Dr. Girdwood, in favour of the use of grains for stock of every description. Those who object to their use might just as well object to the feeding of milch-cows on green-corn.

"Fresh brewers' grains are three-quarters water. Considering this, their nutritive constituents run very high." Prof. Henry "On Brewers' grains as cattle-food."

Well! even if they do hold 75 per cent. of water, how much water does a swede contain? Or a mangel? Or green-corn?

Swedes.	Green-corn.	Mangels.	Brewers' Grains.
Water—87 per cent;	83 p. c.;	88 p. c.;	75.2 p. c.

Of course, if you are going to cram a bushel of grains a day down your cow's throat, with nothing but straw as "roughage," the milk will not be very rich; but with plenty of other foods, such as pease-meal, crushed flaxseed, etc, and half a bushel a day of grains, your cows will give plenty of good, creamy milk, and will do very well as regards their health.

The calf—The United States Secretary of Agriculture, late Director of the Iowa Experiment-Station Prof. James Wilson, in the *Jersey Bulletin*, gives some advice on the weaning of calves with which we agree thoroughly; probably because it is in exact concordance with what was our own practice as long as we bred calves: he takes away the calf as soon as the cow has dropped it, never allowing the dam to see its progeny until it has thoroughly forgotten all about its birth, and advises the skim-milk to be fortified with *crushed flaxseed*, instead of *linseed-cake* (oil meal), assigning very sensibly, as a reason, that the latter contains, as its chief constituents, lots of protein, a principle in which the skimmilk is rich enough already; whereas the skimmer having deprived the milk of its fat, that constituent is easily replaced by the flaxseed, 35% of which is oil.

If the young cow is never sucked, she never expects it. Of course the calf should have the *colostrum*, the first milk, as it is nature's laxative that expels all the indurated fæces from the calf's bowels.

It is astonishing to us that these simple truths are not yet appreciated by the general run of farmers. In the very same issue of the paper from which the above is condensed, we find a well known breeder giving the following as the proper treatment of newly born calves:

"When the calf is dropped we allow it to remain with the dam for a few hours, usually just long enough for it to get a good square meal of the mother's milk. It is then removed to a comfortable box-stall and taught to drink from the pail as soon as possible. We find that both the cow and the calf fret much less over the separation whent his plan is followed."

And, again, another breeder speaks in the same strain:

"When a calf is dropped we leave it with its dam until it is perfectly dry and on its feet. We let it suck the cow perhaps once or twice, then remove it either to a box stall by itself, or tie it up along with other calves, but never close enough so that they can suck one another."

Far better cover the calf over with lots of the softest straw to be found, and leave it for six hours, or so, before any attempt is made to teach it to drink from the pail. What earthly good can be derived from "letting the calf suck once, or twice"?

Where the cow is one of the Sussex, Galloway, or Hereford breeds, or from a herd of non-milking Shorthorns, where the custom is to let the calves run with the dam for some months before weaning (in the case of the Sussex cattle, even up to a twelve-month), there is nothing to be said but that the practice saves labour.

Grade-Shorthorn steer-calves are selling in England now for 45s. ($11.00) a-piece at ten days old. We remember when, about 1848, Baron Rothschild's huntsman bought calves of that strain in the Aylesbury market at the rate of three for a sovereign, as being the cheapest meat to be had for making the soup for the Baron's stughounds!

February.—Although it is not unnatural in a mild winter to fancy as the days lengthen that we are "getting through very well" the beginning of February is not unfrequently marked by the commencement of a spell of hard weather. This was recognised by our forefathers, who fixed the theory by reference to a particular day, the Feast of the Purification, or Candlemas day. An old Scotch saying runs: "If Candlemas day be dry and fair, the half o'winter's to come and mair; if Candlemas day be wet and foul, the half o'winter was gone at Youl." In other words, if the weather at the beginning of February is fine and frosty, we may expect more winter to follow than we have already had. The same motion is expressed in a German proverb quoted by Dr. Brewer, which runs: "The badger peeps out of his hole on Candlemas day, and if he finds snow walks abroad, but if he sees the sun shining, he draws back into his hole."

No doubt these old sayings are founded on observation, and consequently, although not of course to be literally accepted as regards the particular day, have some ground of probability when taken as referring to the period. In the same way the legend of St. Swithin has no doubt a basis of reason if it be taken as applying not to that actual day but to the prevailing meteorological conditions about that time.

It may be of interest to note that the authority above quoted states that Candlemas day is so called from the custom in the Roman Catholic Church of consecrating all the candles which will be needed in the church during the year, and in connection therewith there was a candle procession. There was also an old Roman custom of burning candles to the goddess Februa, mother of Mars, to scare away evil spirits. The month of February was also among the ancient Romans the month of purification.

From the farmer's point of view February is the month of resuming active work. The dairymen's year nowadays has, under the pressure of milk contracts, lost its old-time symmetry, and calves in most well-regulated herds may come in almost any month. But Candlemas is still associated with the arrival of calves, while in the southern half of the country the month is probably the busiest of the year for the shepherds in the lambing pens It marks the season of new awakening life on the farm, and whatever the weather may be, or however low the thermometer may fall, the gathering strength of the sun and the slow lengthening of the day mark the fact that the stagnation of winter is past and the brisk vigour of the spring is throwing its outposts, so to speak over the lank. P.

It would be well to remember that the Candlemas Day referred to above was "Old Style," i. e., not our 2nd of February but our 14th. All other ancient sayings require the same modification: the "Mayfly" (The Green-drake) for instance, though described in the dictionary as a "neuropterous insect of the genus *ephemeris*, that appears in May," is rarely to be met with, even in southern England before the tenth of June, i. e., May 29th, "Old-Style."

Markets.

METROPOLITAN CATTLE.

Islington,—This day.

SUPPLY AT MARKET.	To-day.	Corresponding date 1899.
Beasts	1,280	1,430
Sheep and lambs	8,220	9,130
Calves	—	—
Pigs	—	—
Milch cows	50	50

ARRIVALS.	
Scotland	34
Ireland	112
Norfolk, Suffolk and Essex	413
Midland, and Home counties	699
Devon	20

ENGLISH QUOTATIONS PER 8 LBS. (SINKING THE OFFAL).

	Inf. s.	Inf. d.	Sec. s.	Sec. d.	First Qua. s.	First Qua. d.
Beasts	2	10	4	2	4	10
Sheep	3	4	4	10	5	8
Calves	—		—		—	

	Inf. s.	Inf. d.	Sec. s.	Sec. d.	First Qua. s.	First Qua. d.
Pigs	—		—		—	
Lambs	5	8	6	0	6	6

Milch Cows, per head, £15 to £21 10s.

The number of beasts on offer to-day, compared with last Monday, showed an increase of 30 head. Owing to the outbreak of foot-and mouth disease in Norfolk, consignments from that county were somewhat shorter, though not to the extent anticipated. For best quality trade ruled firm at an advance of from 2d. per 8 lb., in consequence of which sales were rather slower. Amongst the Irish consignments were 62 two-year old stores, which were quoted at £11 to £12 per head; fat cows were in steady demand by country buyers, and made fully late rates; fat bulls and rough cattle were more difficult to vend. The following quotations are for the primest of each class per 8 lbs. (sinking the offa) :—

			To-day.		Corresponding day last year.	
			s. d.	s. d.	s. d.	s. d.
100	"	"	4 8	— ..	4 4	—
95	"	Runts	4 3	— ...	4 4	—
90 to 95	"	Norfolks	4 9	— ..	4 4	—
100	"	Shorthorns...	4 6	— ..	4 0	—
110	"	" ...	4 4	—	3 10	—
95	"	Irish.....	4 4	— ..	4 2	—
90	"	Fat cows	4 0	— ..	3 6	—
90 to 95	stone	Scoth	4 10	— ..	4 6	—

The number of sheep on offer to-day compared with Monday last, showed an increase of 356, the supply including 4,740 from Norfolk, Suffolk, and Essex, and 180 Scotch. For choice-quality, meaty Down and half-breds trade ruled firm, last week's rates governing all transactions; middling-quality sheep, however, were easier in price, besides meeting with a slower trade. For ewes there was more inquiry and a light supply; these consequently sold to better advantage. The few lambs penned were difficult to cash, very few being bought by retail butchers. Leading pens made per 8 lb. as follows (sinking the offal) :—

			To-day.		Corresponding day last year.	
			s. d.	s. d.	s. d.	s. d.
7½ to 8	stone	Downs.....	5 8	— ..	5 8	—
8	"	Scoth	5 8	— ..	5 6	—
9	"	Downs.....	5 6	— ..	5 4	—
10	"	Downs.....	5 4	— ..	5 2	—
10	"	Half-breds	5 4	— ..	5 2	—
10	"	Ewes..... ...	4 4	— ..	4 2	—
11	"	Hampshires...	—	— ..	5 0	—
12	"	Lincolns.....	5 0	— ..	4 10	—
5	"	½ bred lambs..	6 6	— ..	6 8	—

Liverpool.—Friday.—Attention was directed to the wide margin between the prices of sulphate of ammonia and nitrate of soda, and the latter article has advanced fully 10s. per ton; it is now £8 10s. to £8 15s. per ton, according to quality, and demand fair thereat. Kainit and basic slag slow of sale, at unaltered prices. Some inquiry is experienced for superphosphate of lime, and the various tests are as per suscribed. Oilcakes are in increased consumptive request, and values all round are firm, and owing to the scarcity of American linseed cakes holders have secured an advance of about 5s. per ton. Nitrate of soda, best quality, i e., guaranteed 95 per cent., pure, in bags, £8 15s. per ton; East India bone meal, in bags, £4 15s. to £5 per ton; Kainit, prime, 23 per cent., in bags, £2 7s. 6d. to £2 10s. per ton. Linseed cake, American thin oblong, prime, in bags, £7 10s. to £7 15s. per ton; linseed cake, English, prime, in bulk, £8 10s. to £8 15s. per ton; linseed cake, foreigh, round, prime, soft and oily, in bags, £8 to £8 2s. 6d. per ton; cottonseed cake, N. A., decorticated, fair to prime, new, in bags, £5 15s. to £6 12s. 6d. per ton; cottonseed cake, English, decorticated, prime, soft, new, in bags, £6 17s. 6d. to £7 2s. 6d. per ton; cottonseed cake, English, undecorticated, prime, in bulk, £5 2s 6d to £5 7s. 6d.; cottonseed cake, crushed, 20 to 25 per cent. oil, in bags, £7 7s. 6. to £7 10s. per ton; rice meal, Rangoon, as imported, in bags, £5 2s. 6d. to £5 5s. per ton; Indian meal, coarse to fine grinding, prime, in bulk, 9s. 6d. to 10s. per 240 lbs.; linseed, fine bold feeding, screened, in bags, £2 15s. to £2 17s. 6d. per quarter, 416 lbs. D N.S. brand superphosphate of lime, guaranteed 25 to 27 per cent. sol., in bags, £2 2s. 6d. to £2 4s. 6d. per ton at the producing depots; ditto, ditto, guaranteed 30 to 31 per cent. sol., in bags, £2 8s. 6d. to £2 10s. 6d. per ton at producing depots; ditto, ditto, guaranteed 35 to 36 per cent. sol., in bags, £2 18s. 6d. to £3 0s. 6d. per ton at producing depots; basic slag, prime quality, guaranteed 30 to 35 per cent. phos., in bags, £1 11s. 6d. to £1 13s. per ton, at the producing depots; ditto, ditto, guaranteed 35 to 40 per cent. phos., in bags, £1 14s. 6d. to £1 15s. 6d. per ton at the producing depots; basic slag, finest quality, guaranteed 38 to 45 per cent. phos., £1 16s. 6d. to £1 17s. 6d. per ton, et the producing depots.—*H. Jones, & Co., Brokers.*

Beet-sugar again.—We extract the following report from the *Ottawa Valley Journal* of the 20th inst. We have only to remark that we shall not invest any of our funds in the enterprise. ED.

A $500,000 FACTORY.

A BIG AMERICAN-CANADIAN ENTERPRISE.

A Scheme to Make Beet Sugar in Canada has Been Started by Two Ottawa Men.

The establishment of a $500 000 factory for the manufacture of beet root sugar in Canada, it is said, will shortly be undertaken by American capitalists who are working with Messrs. J. E. Askwith and James Fowler of Ottawa in the interests of the enterprise. The factory will be located in Ontario, and will, it is said, be capable of handling daily 500 tons of beets. When the factory is started it will, it is said, be necessary to pay $250,000 out every season to the farmers to be used for the purpose of feeding the cattle.

The government is to be asked to place a bounty on the production of beet sugar in Canada, and this the promoters of the company claim will ensure the establishment in Canada of a great many other factories for making beet sugar. Mr. O. E. Culbert is solicitor for the promoters.

SEASONABLE NOTES.

Cotton cake and clover hay.

Will you inform me what is considered to be the feeding value of the best under corticated cotton cake as compared with the best clover hay?" So asks a correspondent, perhaps little thinking of the difficulty of answering such a question. If the matter is looked at from a chemical point of view alone, the two substances may be readily compared. This is what we see :—

	Undecorticated cotton cake.	Clover hay (very prime).
Water	11·5	16 50 per cent.
Ash	6·3	7 00
Albuminoids	24·6	15 30
Crude fibre	20·8	22·20
Non-nitrogenous soluble	30 6	35 80
Fat	6·2	3 20
	100·0	100·00

According to Wolff the value as food of these two substances, as indicated by the above analyses, are 5.46s per cwt. for the cotton cake and 4.28s. per cwt. for very prime clover hay. That is, the cotton cake is worth for food alone about £5 9s. per ton, and the best red clover hay is worth for food alone £4 6s. per ton. The two foods are fairly comparable, and the food values approximate to the market prices usually paid. If clover hay of the best quality can be bought at £4 per ton, it would be about equally profitable with cotton cake bought at £5 per ton. The question is, however, not thus quite settled, as there is reason for thinking that the cotton cake is more valuable in its residual manurial effect. On the other hand, good clover hay may be considered as a more natural food, being capable of being used more freely and for a greater variety of purposes. Clover hay varies much more in quality than good, sound cotton cake, and is, perhaps, subject to more waste. The manurial value of cotton cake is indicated by the large proportion of albuminoids, which are probably in excess of what is needed by the animal. It is also richer in fat, so that looking at the two analyses the cotton cake appears to be a good deal better than the clover hay both for food and for manurial proposes. Supposing that it is intended to purchase either of these foods it would seem much better to spend money on cotton cake than on clover hay for either cows or sheep.

The difficulty of measuring the values of foods by analysis is very great, but on the whole, sound linseed and cotton cakes may be trusted at present prices as profitable foods. For some time past cotton cake has been dear, but just at present the best cottons can be bought at £5 5s. per ton delivered, or about their feeding value, and this leaves a considerable margain for profit in their manurial value.

At one halfpenny a pound the price per gross ton of any food is £4 13s 4d., so that cotton cakes, when cheap, can be bought only fractionally above this price. If half the value remains in the form of manure, it is evident that the cost upon the animal is only a little above one farthing per lb. for cotton cake; but it is more satisfactory to charge the entire cost of the cake against the animal, and if judiciously given I believe that it will easily pay for the extra indulgence. Cake pays three times—first, through the animal consuming it; secondly, in the crop which follows; and thirdly, in succeeding crops.

Sheep pay better for the cake they consume than cattle, because there is less waste on the land than in the foldyard. There is less wasting of manure by rain, and every particle of cake, whether eaten or wasted, finds its way into the soil.—*Ag. Gazette.*

AT THE NEW YORK INSTITUTES.

Ed. *Hoard's Dairyman*:—One of the local speakers on the program at one of the institutes, was Captain Wm Hymers, of Delancy, N. Y. Captain Hymers is one of the successful dairymen in Delaware county. He mows and cultivates about 50 acres, and besides has some poor pasture and rents a little more. He is now keeping 40 cows, 10 head of young cattle, and three horses.

Corn for fodder, is the main crop on his farm, and he buys, to feed with it, mostly bran. He believes in saving all the fertility made on the farm. He has tight stable floors, uses cut staw for an absorbent, and draws out his manure and spreads it every day. The horse manure is also used in the gutters as an absorbent. He manures every year all the land he plows and mows, except the oat ground. Manure on this would cause the oats to lodge. His plan is to apply only a light coat of manure, and so get over his land oftener. He said that there is no need of the Delaware county farms running down where the farmers buy so much grain and do not sell hay, and their farms ought fo increase in productivness if all the manure is saved.

The fact that the Captain has lifted two or three morgages in his life is evidence of the practicability of his methods. He spoke of two other farms near him where the manure was allowed to waste by leaching in piles, and the liquid was not saved by tight gutters and absorbents and the farms are growing less fertile and productive. One farmer present told how he tried to give his cows the best care and feed, and yet he failed to get as much milk from his cows as some stated they were getting. The Captain told him that he thought he could tell him one reason why he did not get more milk. He said: "I was in your stable the other day when you were absent. I found everything very nice but it was a cold morning, and the stable doors were standing open. Your cows could not do their best in that stable in that temperature. You need a thermometer in your stable, and do not let the temperature in it get below 60 degrees. Cow that are chiled by contact of cold air cannot give a full flow of milk" Many farmers who feed a balanced ration and give their cows otherwise good care, would get more milk if they would keep their cows warm. On cold days don't leave the cows out in the cold, nor allow the stable doors to be left open.

ALFALFA IN NEW YORK.

Last fall I visited the New York Experiment Station at Geneva and saw a field of alfalfa that contained three and 74–100th acres. The yield last year was 16 tons and 300 pounds of hay at two cuttings. Another cutting late in the fall yielded five tons of hay, making a total of 21 tons, or more than five and one-half tons per acre of hay, in one season. As some may know, alfalfa is a kind of clover, and is therefore rich in protein. A ton of alfalfa hay contains 220 pounds of protein, almost as much as a ton of wheat bran which contains about 244. A ton of dry corn fodder, ears and all, contains only about 50 pounds of digestible protein. On suitable land one can grow in one year 20 tons of green alfalfa, or as many tons as can be grown of green corn fodder.

Where alfalfa can be successfully grown, it seems to be a very valuable crop for soiling, and for hay. It was formally thought that it was only adapted to the soils of some of the western states, but I have heard several reliable men say at the institutes that they were satisfied that it can be successfully grown in this state if given the right treatment. It has been found to do well on both light and heavy soils. The soil at the experiment station where it succeeded so well is a very heavy clay. The soils need special preparation for sowing alfalfa. First, it should be worked deeply so the plants can send the roots downs deep for water, and it should be made quite rich to start with. A very fine seed bed should be made before sowing the seed. Sow the seed without any grain crop, and when it gets started well, mow the field to keep down the weeds. *No!* Ed.

If the crop can be once well established it will grow well for several years without renewing. Rich, well drained soil which contains no free water, and a fine seed-bed in which to sow the seed are the essentials to success. Twenty pounds of seed per acre is about right. Prof Voorhees, of the New Jersey State Experiment Station, stated that last year they grew 20 to 26 tons of green alfalfa on an acre, and the protein this contained would now cost in wheat bran $108. It would appear what is now known but alfalfa in this state, and considering the value of the crop, many farmers will do well to experiment some with it on their farms.

Delaware Co., N. Y. W. J.

Experiments on Mangels.—We have received from Mr. Bernard N. Wale, Instructor at the Agricultural side of Brewood Grammar School, Stafford, a report of the experiments carried out in 1899 on the land connected with the institution. In a trial of various dressings of artificial manure on three varieties of mangels the greatest average yield, 27⅝ ton, resulted from the application of 4 cwt. of nitrate of soda, 3 cwt. of superphosphate, and 4 cwt. of kainit, at a cost of £2 19s. 10d. per acre. This was 8 tons more than the yield of the unmanured crop, so the dressing paid well. Where the superphosphate was increased to 5 cwt. the yield was slightly less. Where the nitrate was reduced to 2 cwt. the yield was 3 tons less, and were it was reduced to 1 cwt. the crop was less by about 4½ tons. Where kainit was omitted the yield was over 5½ tons less, and where superphosphate was omitted it was fully 3 tons less.

The use of potash salts is probably on most soils not needed, where dung is pretty constantly used; but where this is not the case, their aid should not be neglected.—*Ag. Gazette.*

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

ABOUT SKIRTS.

The tight fitting skirt has quite gone out of fashion, at which many people will rejoice. It had few real admirers, and not a great many patrons, as it was not a skirt that could be converted into another mode without extra stuff, and this is the only possible way of doing it over and making into a wearable skirt. It took less material to make than the ordinary skirt, so those who bought the usual quantity had a good bit left over, which will now come in handy and enable the owner to convert the discarded skirt into one which can still be worn. A double box pleat is put into the back part, thus giving extra width and more freedom for walking, and it will retain quite a fashionable appearance.

LONG TRAINS.

It makes one sorry to hear of these fashionable abominations coming into vogue again; they are very nice, and most ladylike for the house, but it makes one sad to see people who ought to know better sweeping the streets with their nice dresses. It is truly hard work to hold up a skirt for a long time, as those who are in the habit of doing so can testify. It makes walking hard exercise all the time. Any person who has been in the habit of clutching at the skirt, to keep it out of mud or slush, knows what a task it is to do so; and when the greatest care has been taken, to find a part had been trailing all the time in the very objectionable refuse of the streets, to find that part damaged beyond repair, they will be very glad to return to a nice walking shirt, which needs no catching or holding up, but leaves the wearer to enjoy a walk in perfect freedom. Trains were never meant for walking in; they are only fit for those who drive, and seldom walk more than a few yards to or from the carriage to the door.

LONG SKIRTS.

At first sight it seems funny to connect neuralgia with long skirts, does it not? but a learned professor (a German of course) has been holding forth on the subject of these long shirts of ours to a large number of strongminded ladies, and the conclusion arrived at, was—that the long trailing skirt, which refuses to be held up on a muddy day, is a source of strain and worry which leads to neuralgia and other nerve troubles. I think the state of one's temper, after a day's shopping, when the dreadful long skirt has been a trouble to us, will tell us plainly that such a strain does exist. The professor went on to say that long walking dresses are not hygienic, that they interfere with liberty of movement and beauty, and that, therefore, they should be avoided by every sensible woman who values her health. Alas! Professors may preach, if dame fashion sets her seal of approval on a garment. We all know that long, heavy skirts are awkward to get about in and tire one dreadfully; that tight lacing injures the health, that squeezing up the toes spoils our carriage, yet, because they is fashionable, we continue to do all these things daily.

PETTICOATS.

These garments must also undergo a change.

During the reign of the tight skirts they had to be made as flat as possible, now they must return to their former fulness and be gathered and fastened at the back.

It is easy to sum up the detail of the new costume adornments. It comprises any amount of stitching, braiding, piping, and tucking. Tiny buttons are now used as trimming; they are placed closely one over the other, and scrolled to form some kind of pattern. It is a novel arrangement.

The new crimson reds are very becoming. They don't need the amount of toning down with black which was required for last year's brilliant tomato-reds. At the same time, we must remember that tomato-red, which has a certain proportion of yellow in it, is more becoming to dark or sallow-skinned women.

A NOVELTY.

One of the latest novelties in trimmings this winter is velvet lace. Of course, it is very expensive, for to begin with, it has to be made out of very good quality velvet, cut out, embroidered, and beaded. This trimming is really quite a work of art, so beautifully is the embroidery worked and so lovely is the design. This unique trimming is used flat in bands or in any way that ordinary lace is used.

A SUBSTITUTE FOR SERGE.

How often one hears the remark, "I wish there was another material as serviceable as serge; nothing wears like it, but, oh! I get so tired of it!" Till quite lately nothing half so durable as serge was to be had, but now there is a new dress fabric called "crepoline cord," which is said to possess all the virtues of our time tried old friend, and yet be a change from it. Crepoline cord, so far, is only made in either navy or black, but a very smart-gown may be fashioned from it, and one with any amount of hard wear in it. I have not yet seen this cloth myself, but I am told it is far more agreeable to the touch than serge, and is distinctly worthy of a trial as a change from serge.

FOOD FOR BRAIN-WORKERS.

Diet is all that one needs for brain-work. That which builds and feeds the muscles of the little finger builds and feeds also the brain. One cannot eat food to build up any special part of the anatomy. A sound mind in a sound body only can do good work. Understand that the man who follows physical labor should not eat the same food as the man who follows mental labor. Each man must have a line of food especially adapted to his position in life. Rest is necessary to the mental worker, and I doubt if he needs food before retiring. (1)He will do better work on two good meals a day than four. The energy expended digesting the two extra meals will count more if saved for mental labor. We can do only a certain amount of labor, mental or physical.

THE PROPER WAY TO BROIL BEEFSTEAK.

To get a perfect beefsteak select a cut of what is commongly called a Porterhouse steak. This is the first cut of the surloin without the undercut. Have a steak cut three inches thick. Put it on a broiler with a pan under the broiler to catch the dropping juice. Place the steak under the flame in the broiling oven of the gas range. As soon as it is well browned pull the steak forward, sprinkle this side with salt. Then turn the steak over two or three times, and broil it as you like it, medium or rare. Have a hot dish near, with a little pat of butter on it. As soon as the steak is done, serve it at once. Carve it in rather thin slices, cutting right down through the steak.

FRITTER BATTER.

Beat up the yolks of two eggs with one and a half table-spoonfuls of brandy, ditto of salad oil, and four or five of cold water; next put in by degrees three table-spoonfuls of good dry flour. If for a savory, add a salt-spoon of salt; if otherwise, add pounded sugar to taste. Make this into a very smooth paste, and beat it for ten minutes. If too thick add a little more water; it should cover the spoon when it is lifted out with a coating three eighths of an inch thick. Beat the whites to a stiff froth, and stir them in the last thing. Half of this will make enough for two or three people. This batter will make very good pancakes, with the addition of sugar and served with sugar sprinkled over; and those who like batter short and crisp will appreciate them more than their brother, the stouter and more substantial pancake.

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(1) In England we used to "go to bed;" in the U. S., they may "retire" if they like; but then they talk of a "rooster" there, and other absurd pieces of false modesty. Ed.

MILK SHOULD BE BOILED.

The question of the habitual use of uncooked milk is one demanding serious attention of every person, more especially those who have the rearing of young children, whose chief foon is milk. Often have milk epidemics of typhoid fever, scarlet fever, and diptheria shown conclusively how severely the incidence of the decease in question has to be contended with in connection with our milk supply. It has been demonstrated that the cow herself may suffer from a disease which at present the dairy men recognise as unimportant but which may give to the milk, at the actual moment of entering the pail, the power of producing disease if used in the raw state.

BLANC-MANGER AND JELLY.

Procure a pint packet of any bright coloured table jelly, dissolve it, and pour on a wet, shallow dish to cool. Next take a pint packet of the blanc-manger powder, either almond or vanilla flavour. Cook as directed on the packet, and when rather cool pour into a number of pretty little moulds; set aside to get quite cold. When ready to serve turn out the moulds on a dish, cut out fanciful patterns from the jelly and lay on the top of each mould. The rest of the jelly may then be chopped up, and the dish prettily garnished with it.

TASTY DISHES.

Turkish broth, which is easily digested, should be made as foollows :—Two pounds knuckle of veal, two onions, one small head of celery, two quarts of water, one blade of mace, quarter of a pound of rice, one ounce of flour, salt and pepper. Break the bones, cut up the veal of the knuckle, put into a pan with cold water; bring to a boil and skim; add the vegetables cut up, also mace; simmer slowly three or four hours, and strain; put back into pan with seasonings and rice. Simmer about twenty minutes, or until rice is soft. Mix flour, drop into soup, boil up, and serve.

BEEF A LA MODE.

Here is a good way of preparing beef à la mode: —Melt two ounces of beef dripping in a stewpan; fasten two pounds of steak in a nice shape, flour it, and fry a nice brown on both sides. Pour in good stock to barely cover the beef; add a dozen or so of mushrooms, peeled and cut in halves Simmer gently for three hours, when the meat will be quite tender. Serve on a hot dish, with the mushrooms round it. Skim off the fat from the gravy, thicken it with brown roux, pour over the meat, and serve.

SHORTBREAD.

Royal short bread is prepared in the following fashion :—Four ounces each of flour, arrowroot, sugar, and butter, the yolk of an egg, two ounces each of dried cherries, almonds and candied peel, all cut very small, and a pinch of salt. The butter is first rubbed into the arrowroot and flour just as in making short pastry, then the fruit is put in, and lastly the sugar and egg, the whole being well worked together. Ornament with chopped almonds and fruit, and bake in a moderate oven until of a pale brown colour.

The Grazier and Breeder.

LIABILITY TO AND IMMUNITY FROM CONTAGIOUS DISEASES IN ANIMALS.

It is well known to stockowners that certain diseases are confined to particular classes of animals while other affections may attack all the animals of the farm without distinction.

When pleuro-pneumonia appears in a herd of cattle, the farmer does not feel the least concerned about his horses, sheep or pigs as he knows that these animals are refractory (as pathologists say) to the infection of this disease. Glanders among horses is a terrible disorder, and every stockowner, would be seriously alarmed at its appearance in his stables, and with good reason. But no apprehension would arise as to the risk incurred by the rest of the stock on the farm. Swine fever is a special malady of the pig and does not threaten horses, cattle or sheep; while an outbreak of anthrax excites alarm in respect of all the live stock, as neither horses, cattle, sheep, nor swine, are exempt from liability to suffer from the affection, and that all attempts to infect the cow with smallpox of man have failed, and that cowpox is not smallpox modified by passing through the system of the cow. Nevertheless it is admitted that it has the power of producing immunity in the vaccinated person.

Numerous attempts have been made of late years to obtain protective "vaccines" for the protections of the lower animals; and the first important step in this direction was taken by Pasteur, when he produced a modified virus of fowl cholera by exposing his cultivation of the microbe to the influence of the atmosphere for certain periods.

Cultivated virus has long been used in France to inoculate sheep to protect them from natural disease.

A new departure in securing immunity was made when it was discovered that the serum of blood, or fresh blood, has a power to destroy various microbes. One authority has succeeded in separating from the blood a person refractory to the contagion of any specific disease arose out of the common observations that persons who had recovered from an attack were so protected. It will only be necessary then to produce the disease in a mild form by artificial means to obtain the required safety.

Inoculation from a mild case of small pox was probably the earliest experiment in the direction of securing the condition of system which should enable an individual to resist contagion for the rest of his life.

A very large proportion of cases were successful, and the system of inoculation of children became customary, and flourished until it transpired that some malignant and fatal cases did occur as the result of inoculation, and that the disease spread from inoculated persons and assumed a serious form.

The operation gradually ceased to be used, and was altogether abandoned in favor of Jenner's discovery of vaccination.

It is not well known what relationship exists between the cow-pox of the udder of the cow and human small pox. It may be affirmed even dogs are killed quickly by eating the flesh or lapping the blood of an animal dead of the disease. On the other hand, rats enjoy a remarkable immunity from the malady.

Natural immunity from disease appears to be related in some way to the acquired immunity which follows an attack of a contagious malady. It has been long known as a fact that persons or animals which had recovered from small pox, for example, were generally protected from another attack during their lives; and so well established was this fact, that people who were marked with smallpox were looked upon as so secure that no hesitation was felt in employing them to attend patients suffering from the disease, and the persons themselves did not object to be so employed. Exceptions to the rule occurred from time to time, but not be a sufficient extent to disturb public confidence in the protective efficacy of a prior attack of the affection. Dr. Hamilton, of Aberdeen University, gave a lecture, a few years since, mainly devoted to immunity, and the attempts which had been made to secure it at remote periods. Doubtless, the idea was of rendering a substance, which he describes as a "defensive proteid," in the presence of which, the refractory power of the rat to anthrax virus presumably depends.

It would be satisfactory to know that the animals from which we draw our supplies of meat can be protected from attacks of disease by inoculating with the products of healthy structure, instead of morbid materials, which however carefully they may be modified by ingenious processes of cultivation, as a matter of fact, do not always succeed in destroying the virulence of the poison.

W. R. GILBERT.

ARTICHOKES FOR COWS.

Mr. J. H. E., Nashville, Tenn., asks for information concerning artichokes as feed for cows. Unfortunately, there is very little information that can be given with full confidence in its reliability. The Experiment Stations do not appear to have given them much attention, and elsewhere they have been grown almost exclusively for swine. In former years, there have been inquiries, and answers quite favorable in their character have been received, but they were deficient in specific information, and in some cases were from parties who had seed for sale. In the two or three cases which have come under our personal observations, the parties were not enthusiastic in their favor. Swine do their own harvesting, and in this way save a good deal of labor. When once established, the ground does not require re-seeding for years.

NOTE.—Artichokes do not need boiling, as their starch is in a peculiar state: *inuline*. ED.

The Dairy.

FODDER CHEESE.

To the Editor of the JOURNAL OF AGRICULTURE :

DEAR SIR,—Knowing what the cheese industry has done for this fair Dominion, and of our Province of Quebec in an especial manner, I am induced to pen this article. At the present time, the cheese outlook is a very favorable one. The reports are nearly all of the same tenor ; light stocks, and a fair consumptive demand ; it might even be called a heavy consumptive demand, when high prices are taken into consideration. The great drought in the greater part of the cheese and butter producing section of Great Britain, gave Canadian cheese and butter a good chance last season. So the result was a very high range of prices for both of these articles, for the last 3 months of the cheese-making season of last year.

Butter has now obtained a good foothold in the British markets, thanks to the system of cold storage inaugurated by the Department of Agriculture at Ottawa. The consumers of our butter imagined we could not make a superior quality for some cause or other, but they have now got converted from that idea, and now know that we can make good butter and can land it also in the British market in good condition. It will be plain sailing, the prejudice is nearly overcome, and what with our loyalty, and other things, anything from Canada is hailed with delight over on the other side. Our butter-makers must study the taste of consumer, make a rather mild butter, not too salt, of fine flavor and pale in color ; take care of it while under their care ; see that is is shipped in refrigerator cars, and that it is sent promptly and continuously to the other side. Then our butter-trade will continue to increase by leaps and bounds as it has done the past two seasons.

Several writers and the Montreal Cheese and Butter Association have advocated not to make any fodder cheese, or as little of it as possible. I noticed one cheese-board in Ontario, or rather some members of that board, criticising the said association : "What right had they to dictate to farmers what they should do ?" The farmers sometimes forget that the Butter and Cheese Association of Montreal knows more of the wants of their customers than all the farmers in Canada put together, and is therefore in a position to offer advice of the right kind, if they will only accept of it in the spirit in which it is offered, viz., for the good of the trade in general.

Mr. Editor, I suppose I may be pardoned if I should offer some advice to the farmers and proprietors of cheese factories. I should say as I have said before, make as little fodder cheese as possible. I am well aware of the fact that with cheese and butter at present prices, there would be more money in cheese, but I am not looking at present profit, but for the future good of the trade.

Fodder-cheese, even when well made, is a very poor article, and does not reflect on us as Canadians any credit. If those factories which are fitted up to make butter would do so until May 1st in Ontario, and say 15th or 20th of the same month in this province, you would see what future prices of cheese would be. And those factories which are not equipped for both, not to open until there is lots of milk in the section, what a difference there would be if there were united action throughout the whole length and breadth of our land !

Do farmers for a moment suppose that present prices will prevail for new cheese for any length of time? Then I should say be careful that you do not kill the goose that lays the golden eggs, by making early fodder cheese, that will a drug on the market, and a menace to our good cheese made later on.

Calves for veal if well fed will give a good profit also. This is another way that the early milk can be utilized instead of making fodder cheese. Do not be afraid to fatten your calves in a first class manner, as you can always get a superior price for a first rate article. And those calves that you wish to raise to renew your future herd will be none the worse for the skim-milk, while a little mixture of the whole article will do no harm, if it is not done too extravagantly. The young pigs, too, can be treated liberally at this season of the year, for as soon as the cheese factory starts, the whey is just rather thin for very young pigs. So taken all in all, you will find it to your advantage to delay the cheese-making until first grass. By the time you have reached grass-cheese (or rather grass-made cheese), if my advice has been followed, you will get a good profitable price for cheese, and that for a considerable period, too. Last year, our exports of cheese and butter reached over $20,000,000—in round numbers. Let it be

gradual until we reach the same extent with our butter as we have with our cheese in the English market, and our farmers will then be in a prosperous condition.

Yours truly,

PETER MACFARLANE.

10th February 1900.

Thanks for the hint about the calves. Veal, in Montreal, is far from being what it ought to be; it is often tough, dry, and fatless. A really good "fillet of veal," from a well-fattened calf, is one of the most delicious joints ever put on the table.

ED.

BACTERIA.

Lecture by Mr. Samuel Lowe.

I stated that there were no bacteria in the milk so long as it is in the cow's *udder*, if she is perfectly healthy; but you must not imagine that the same holds good as to the milk in the *teat*. In the former case, it is hermetically sealed from the air, while the air, having accesss to the drop of milk left in the end of the teat, impregnates it with bacteria, and, the animal warmth of the cow being just the thing for their development, the milk remaining in each of the teats soon swarms with them. In the first jets of milk that spirt from the teats, are found about 50,000 bacteria to the cubic centimètre of milk, that is about the contents of a thimble, while in the milk towards the end of the milking, there are not more than 500.

Even if I were to enumerate separately the other sources of contamination, it is the atmosphere that is the chief source. Thanks to the kindness of Prof. Russell, of the experiment-station of Wisconsin, I will presently show you on the screen, with the magic-lantern, (1) the importance of that source of infection. Professor Russell showed that, the cows being milked in the cowhouse during winter, there fell on an average, each minute, into a pail, ten inches in diameter, 5,300 bacteria. If the precaution had been taken to wash the cow's udder and the milker's hands, before milking, the number would be reduced to 1,300 a minute. In an analogous experiment, made in the open air in August, the diminution of the number of bacteria was 89%. It is not unusual to give the cows hay just as the milking is about to begin, and when that is done the air is found to be loaded with dust and the spores of bacteria. Prof. Russell's experiments show that, under these conditions, more than 160,000 microorganisms fall into the pail a minute, while if the milking is done under conditions of absolute precaution, the number may be reduced to 2,400 a minute; and the milk drawn in the latter case has kept sweet for 24 hours more than under ordinary conditions, the two milks being kept in the same room. It does not follow that, because so large a number of bacteria get into the milk, that on that account the milk will not keep. The preservation of milk depends entirely upon its subsequent treatment. If the milk were cooled down to a temperature hard upon 32° F., immediately, that is, within two or three minutes after its being drawn, it would keep for a very long time; because, at such a low temperature, the bacteria are reduced to inactivity, and rendered utterly incapable of multiplying. On the other hand, if the milk were carried off at once, heated up to 160° F., and kept there for 20 minutes, all the bacteria present would be destroyed and only a few germs would remain. If the milk, before it could get infected anew with bacteria, were promptly reduced to 50°, it would equally keep sound for a very long time. The chief causes of bad milk are: 1. the introduction of a great number of bacteria; 2. the high temperature at which it is kept; the latter cause being by far the most influential. The warmer the milk is kept, up to a certain degree, the sooner it spoils, because the bacteria develop more rapidly. The activity of the growth of the bacteria induces their rapid multiplication along with quick chemical modifications.

THE SOURCES OF FLAVOUR AND AROMA IN BUTTER AND CHEESE.

Now that you know why sweet milk becomes sour, you will the more easily understand whence the aroma and flavour of butter and cheese are derived. My principal reason for detaining you so long on this subject of bacteria is, to show you that it is to them that we owe both the good and the bad flavour of butter and cheese. I hope to convince you that each distinct flavour or aroma is due to one species of bacteria, and, besides, that it is possible to isolate each of these species, and, thanks to them, to obtain any flavour or aroma we want.

(1) See p. 282 of the 15th annual report of the D. Ass.

In his studies on wines and beers, Pasteur discovered the bacteria that cause wine and beer to turn sour. He also found out that by heating those liquids up to a certain point, it was possible to destroy all these baneful vegetable growths. This process is called, after its inventor, *pasteurisation*. Dr. Hansen has pushed Pasteur's invention still further. He isolated the species of yeasts, which are plants of one cell like bacteria, and he found that each species gave to beer its own flavour. George Jacquemin, and other French vineyardists, applied Hansen's discovery to the making of wine, and found that each wine-yeast gave to wine a peculiar aroma and bouquet. Later researches have demonstrated the complete exactitude of these discoveries, proving thus that in the making of wine and beer, it is really possible, by a minute selection of yeasts, to produce any desired flavour or aroma. Following up Hansen's work, Professor Storch of Denmark and Weigmann in Germany, quickly identified one of the bacteria of milk as the producer of lactic acid, and have cultivated it on a large scale for the making of butter.

Still, it was (1) Lister who was the first to isolate one of these organisms. After some research, the sale began of this lactic acid, in a liquid form, to butter-makers, to be added to the cream to produce in the butter that generally liked aroma. It was soon discovered that in a liquid form lactic acid could not be carried long distances; so it is now to be had in the form of a white powder; and in Denmark and Sweden to-day. 90% of the butter is made with cream fermented by means of this lactic acid in powder. I think, however, that the powder contains more than one variety of bacteria productive of lactic acid, and is consequently, a mixture rather than a pure culture. Prof. Conn, of the Wesley University, Con., announced, two or three years ago, that he had found a variety of bacteria, that alone gave to butter its aroma. Prof. Russell, of the University of Wisconsin. has thrown a doubt on the discovery of Conn. and opposed its claims to the possession of the asserted properties. Conn also laid claim to the discovery of a bacterium that imparts its aroma to butter, but adds no flavour to it. At any rate, before sowing Conn's bacteria (B 41), or lactic acid in powder, in the cream, it would be better to pasteurise it; for this operation destroys all useless or injurious bacteria, and gives to those favourable to the ripening of cream a free field for their development. The flavours then are due to bacteria, and each variety of bacteria communicates its peculiar aroma. As a proof of the exactitude of this doctrine, let us take the case of what is termed turnip-smell.

(*To be continued*)

(1) Sir Joseph, the scientist, not our Dursley friend. Ed.

CHEDDAR CHEESE.

(*Continued*).

Where the standard is to be used frequently, it is better to fit up the apparatus in such a way as to do away with the necessity of frequently filling the burette from a small bottle. The following method was adopted in carrying out the investigations, and has proved to be reliable and expeditious:—

The standard solution of caustic soda was contained in a Winchester quart bottle placed on a shelf well above the rest of the apparatus (Fig. 1) From this, by means of a glass syphon tube, the

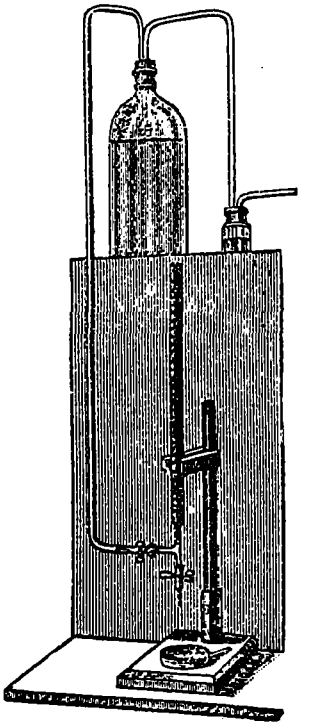


Fig. 1.—Acidity Apparatus.

solution was brought down automatically to the burette. As this standard solution, if exposed to the air, deteriorates by absorbing carbonic acid, it

must be kept in an airtight bottle. But, unless the air could enter the bottle, none of the solution would syphon over. The air so drawn into the bottle of standard solution, was therefore first made to pass through a small bottle of strong soda tinted with phenolphthalein.

This wash-bottle absorbs all the carbonic acid from the air before it passes into the standard solution, while the moment the solution in the wash-bottle loses its power of absorbing carbonic acid, it also loses its colour. This was found to work admirably, and the strength of the standard solution remained unaltered until used up.

The syphon tube containing the standard solution was attached to the bottom of the burette by a —| joint, and the flow of the solution was stopped by a pinch-cock acting on a piece of indiarubber tubing, which connected the syphon and —| joints. (Fig. 2.) Upon opening this pinch-cock, the standard solution flows into the burette and carries up the float. When the line on this

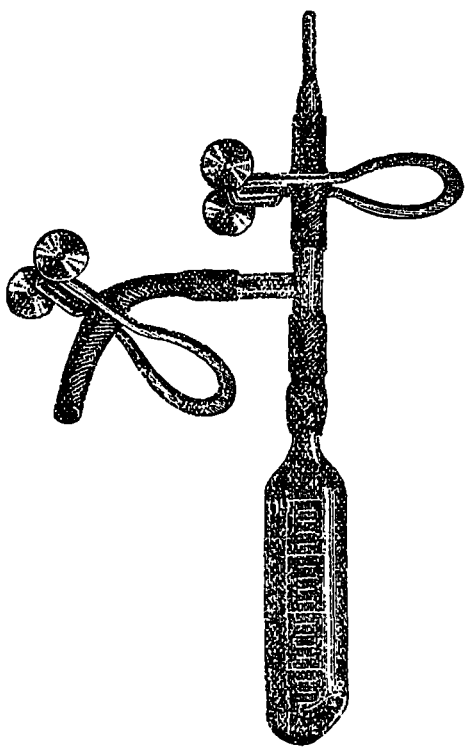


Fig. 2.—Burette Arrangement.

float corresponds with the first mark on the burette, the pinch-cock is closed. The burette is now full.

The tests are then made exactly as above described.

Not only has the acidity apparatus enabled me to obtain considerable insight into the chemistry of cheese-making, but its use is no longer confined to mere purposes of investigation. It has been placed upon the market, and there are many cheese makers now employing it daily. The evidence which I have received from cheese-buyers tends to show that its use has resulted in a considerable improvement of the cheese made, not only as regards quality, but also as regards uniformity. The use of the acidimeter might be taught with advantage in the schools of every county where cheese-making is carried on.

(To be continued.)

ROOTS FOR COWS.

Ed. *Hoard's Dairyman*:—There is, unquestionably, no food that can be more healthful, appetizing, and at the same time act as a corrective for the system generally, than a liberal allowance of good fresh beets, (particularly Tankards), and while we are making use of the corn crop more largely as the seasons go by (having this year over twenty-five acres all told) and not having a silo, we are free to say, that just as our stock of experience in feeding is added to, in just that same proportion does our appreciation of that great succulent food, mangels, increase. And although not yet being quite far enough along, as we thing, to make use of the silo, and for which I have all due regard, I still take the broad ground, though I were using ensilage, and seeking to build up a fairly large herd of butter making cows, (as I am doing, by having at the head of my herd a thoroughbred sire of the best butter breed strains,) that I would then still continue to grow and feed mangels, for the sole purpose, if for no other, than that of maintaining that degree of health and vigor on the part of the dam so necessary for the transmission of perfect dairy qualities to the offspring. For I am quite certain, judging from observation close by home, and the experience of some large dairymen, who have been feeding ensilage for a long time, that it is fact, that the varying forms and changing conditions of ensilage, from year to year, contain acid to that extent (even though fed in connection with dry feeds,) that the cow's digestive and birth-giving organs and functions cannot fail of becoming somewhat impaired, where the dam is kept till old age,

mainly with the view of raising her heifer calves with which to build up the herd. No feed in winter, in fact, seems to come nearer to nature's feed (grass) for the milch cow than good, fresh beets, and no feed, not even ensilage, seems to be eaten with a keener relish than this, and it would seem that the natural instinct causes this keen relish to serve as nature's cleaner and purifier.

I also consider this crop almost indispensable in the raising of pigs, as we keep our sows, when our crop will admit, almost wholly on beets, up to time of farrowing, and a small allowance after.

The secret of growing beets, if there is any, lies in having a clean soil to start with. To secure this, it is best to have the crop follow corn, which has been fairly enriched, and kept scrupulously clean. In this way we have a seed bed that if cultivated early in the season will need but very little hand labor, and if rye is sown in the fall for a cover-crop and plowed under in early spring, it will furnish sufficient humus for the soil, and the same plot can be used for this purpose for an indefinite number of years without change. We have kept an accurate account for different seasons, and find by attention to the details at the proper time we can safely produce from 20 to 25 tons per acre for a cost not to exceed $25.

C. H. WHITCOMB.

Niagara Co., N. Y.

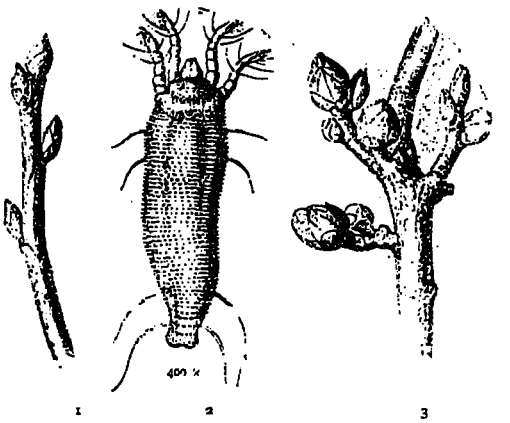
The Garden and Orchard.

(CONDUCTED BY MR. GEO. MOORE).

INSECTS INJURIOUS TO FRUIT AND TREES.

The swarms of insects which prey upon or otherwise injure fruit are appalling; and as many of them are not known to our readers we propose to collate a few of them from leaflets lately published by the British Board of Agriculture from which we condense an account of their life-history and modes of prevention or remedies.

Many of these are so small as to be completely invisible to the naked eye, or even with the strongest pocket lens, and it is only with the microscope that their presence can be detected. Hence, their deleterious effects are a puzzle to the casual observer. For instance, the buds of the Black Currant, instead of being natural, become unduly enlarged, which condition might be taken for a sign of increased vigor; but upon examination with the microscope, these buds are found to be swollen and distorted by thousands of whitish mites, which are feeding upon the embryonic leaves and blossoms, and no healthy leaves or fruit can be produced by these infested buds.



THE BLACK CURRANT MITE — Fig 1. *Phytoptus ribis* magnified 400 times. Fig 2. A normal currant twig. Fig. 3. Currant twig with infested buds.

Mites, on account of their minuteness, are very troublesome insects and are capable of doing a great deal of damage before their presence is detected. There are many species of them, in fact one which is peculiar to almost every species of tree and bud.

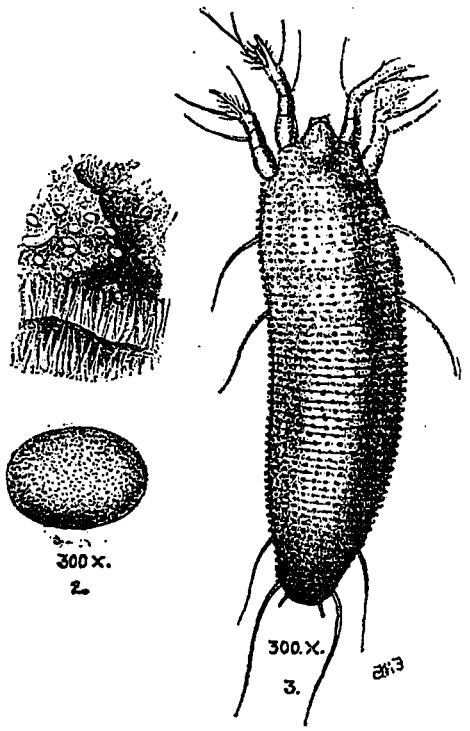
The Nut tree mite is somewhat larger, although also invisible, than the Black Currant mite. The eggs of this are found in the buds in the early spring. Later on, the infested buds dry up and fall off; but the mites have previously left them, and secreted themselves in newly forming buds, which become deformed, are of an unhealthy green color, much enlarged, and finally destroyed.

When Black currants are planted, any which have swollen buds should be carefully rejected.

Cuttings from infested bushes should by no means be taken; for, though there may be no swollen buds, the mites may be in them or under the folds of the bark.

Prune infested bushes very hard, so as to induce the formation of new wood. After the pruning, the bushes should be critically examined, all swollen buds picked off, and all the diseased shoots and buds should be destroyed by fire.

Coal-oil emulsion of the strength of 5 gallons of coal-oil and 5 lbs. of soft soap to 100 gallons of water, well churned together, should be liberally sprayed over the bushes after pruning, early in the autumn, and again in the spring before the buds burst; not after, as the solution would be too strong.



THE NUT TREE MITE. — Fig. 1. Inside of infested bud, showing eggs and mite, much magnified. Fig. 2. Egg, magnified 300 times. Fig. 3. *Phytodtus avellanæ*. Female, magnified 300 times.

Another solution to be used in a similar manner may be made by mixed 6 lbs. of soft soap and 2 gallons of carbolic acid with 100 gallons of water, and in the spring, when the leaves have begun to burst forth, a mixture of 6 lbs, of quassia-chips, well boiled, with 100 gallons of water and 6 lbs. of soft soap, has been found to be effective.

In the fall, after pruning, quicklime, finely powdered round the bushes has a good effect.

The same directions will apply to other mite-infested trees and bushes.

Next to the mites, in point of minuteness, is the Woolly Aphis, or American blight, which is found on the twigs and roots of apple-trees and occasionally upon Plums and Elms when planted near apples. There are winged and wingless females of these insects. The wingless Aphides are carried from tree to tree by the wind, and the winged ones fly from one tree to another. Woolly or cottony substances are found upon the branches of apple-trees, and especially where there are scars or cracks, where the bark has been injured or where side shoots and branches have been badly cut off, so that wet has caused decay; or where the edges of the tissue of bark has not joined, and only a thin tissue covers the intervening wood. These are little groups of aphides in various stages of development, and are actively engaged in piercing the tree with their tiny suckers and feeding upon its sap. Eventually, the whole branch is affected and its vigour impaired. If this continues, the whole tree becomes useless or dies.

These attacks are sometimes mistaken for "canker," which is quite different, and the woolly aphis is the sole cause of the mischief. It also infests the roots, causing swellings and excrescences upon them, evidently feeding upon them also. This is quite distinct from another Aphis, found upon apple trees, *Aphis mali*, which lives upon the leaves and blossoms.

It is wonderful that such small insects should cause such havoc and shows the urgent necessity of watchfulness on the part of the grower of trees. It is only in neglected orchards that the woolly aphis and many other injurious insects get much head-way.

When trees are properly pruned, so that the light and air can have free access, and branches are not allowed to cross and rub against each other, and the trunks are kept free from mosses and lichens, there is no shelter for the aphides and the danger from their attacks is lessened. So the best preventive measure is to keep the trees clean. Lichens and mosses can be killed by powdering lime over the trees in winter in foggy or damp weather, so that it will adhere. This can be done by men with scoops fastened to long poles. Sulphate of iron, in the proportion of 1 lb. to 1 gallon of water, sprayed over the trees in winter will have the same effect. Search should be made for the scars or wounds in which the woolly aphis can find shelter, and they should be filled with a compound of soft soap and coal-oil, in the proportion of 3 gallons of coal oil to 4 lbs. of soft soap and 25 gallons of water, well mixed and worked into the cracks with a stiff brush. At the same time, the whole tree should be sprayed with a

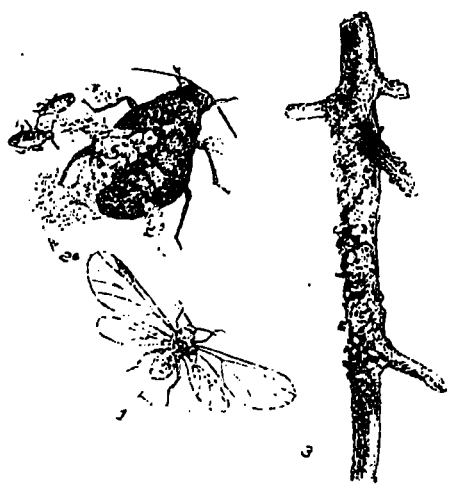
mixture of 5 gallons of coal oil, 6 lbs of soft soap, and 100 gallons of water. The soap must be dissolved in hot water, the coal oil added while the suds are hot, and then well mixed by agitation, and cold water added in the proportion named. The roots also should be examined and the earth removed from the base of the trunk, which may be washed with lime-wash and sulphur. Penning pigs in orchards and watering the roots with very strong liquid manure, makes it very unpleasant for the aphides. Kainit, hoed in round the roots, is also efficacious.

Before planting apple-trees their roots should be dipped well, in a mixture of lime-wash and sulphur.

The Australians have some varieties which, by reason of the hardness of their bark, are aphis-proof; and the same is the case with Northern Spy and the Magentin, a Norfolk (England) variety.

THE WOOLLY APHIS OR AMERICAN BLIGHT.

(*Schizoneura lanigera*).



1. Winged female, magnified; and line showing natural size. 2. Wingless viviparous female, magnified. 3. Apple twig, covered by woolly aphides.

Carelessness and inattention are always punished by insects and other diseases; but with the opposite qualities put in practice we can snap our fingers at them. (*To be Continued.*)

TREES.

The season will soon be upon us when the trees will again be objects of beauty, and, adding their share to the glories of the coming summer, will gladden our hearts with their verdure. Who, without admiration can contemplate the processes of Nature in the growth of a tree from the first bursting forth of its buds, and watch the gradual development of its foliage, until, having performed their natural functions, the leaves assume their autumnal tints and share the common lot of Nature by falling off and mingling with their mother-earth, without admiration?

There is an attractive beauty in the symmetry of the trees that embellish our squares, lawns, and avenues; and an awe inspiring and majestic grandeur in the monarchs of the forest.

Byron says "There is a pleasure in the pathless woods," and Washington Irving, "There is a severe and settled majesty in woodland scenery that enters into the soul; delights and elevates it; and fills it with noble aspirations." As the leaves of the trees are said to absorb all noxious qualities of the air, and to breathe forth a purer atmosphere, so it seems to me as if they drew from us all sordid and angry poisons, and breathed into our minds peace and good will.

He who plants a tree looks forward to future ages and plants for posterity; nothing can be a greater proof of unselfishness.

A poet whose name has escaped my memory beautifully describes the sentiments with which the thoughtful observer inspired by the growth of trees and the lessons they should teach:

Oh who is there within whose heart
The love of noble manhood dwells,
Who feels the thrill of pleasure start
When other tongues the story tells
Of deeds sublime? With true eyes sees
The beautiful in art and thought,
Dares stand before God's stately trees,
Declaring that he loves them not?
Companions of our childhood's days,
Companions still, though grown may be,
Still through your leaves the light breeze strays,
Whispering the same old songs to me.

Dear forest! down thy long aisles dim
Soft sweeps the zephyr's light caress,
Worthy indeed art thou of Him
Who made thee in thy loveliness.
Long may thy graceful branches wave,
Piercing with pride the balmy air,
Harm ne'er would come if I could save
Fit objects of my love and care;
But though erect each noble form,
As year by year rolls swift along,
Thou, too, like man, must face the storm,
And fall or live to be more strong.

For ever upward day by day,
Patient thy growing branches turn,
Nearer the Heavens each year; alway
May we the simple lesson learn,
Thorough few our years or many be,
If matters not the number given,
It we can feel, that like the tree,
Each year hath found us nearer Heaven.

DISHONEST APPLE PACKING.

Unprecedented Frauds Practised by Packers.

It would seem that the good name which has come to Canada and Canadians, by honest and upright methods associated with the development of our export cheese and butter trade, is likely to be entirely lost through the despicable actions of dishonest apple-packers. The deserving castigations heaped upon these unprincipled individuals last spring, by both the press and every honest Canadian citizen, appear to have been without avail, if reports regarding this season's shipments are correct. In fact, these individuals, unworthy of the name of Canadians, seem to have gone several steps farther in their nefarious practices and to have perpetrated frauds on a par with those practised by one of the New England States half a century ago in shipping basswood hams and wooden nutmegs across the Atlantic. Ever since, the word Connecticut in many places has been a by-word for dishonesty among honest people. And so the good name of Canada will suffer, and our export trade in fruit will be ruined, unless these dishonest practices are put a stop to immediately.

A few examples will be sufficient to show how far these dishonest parties will go in their nefarious practices. Mr. Parmelee, Deputy Minister of Trade and Commerce, has received evidence to show that these iniquities are little else than downright robbery. Old, dirty top boots and bundles of kindling wood in the centre of apples barrels would be bad enough, but Mr. Parmelee announces that these things and things worse than these have been done by some Canadian apple-packers. One reliable firm of apple importers in Edinburgh complain of paying good apple prices for old clothes, hay, old boots and other articles that should have no place in a barrel of apples. Another fraud practised is that of labelling barrels of inferior apples with the names of the best varieties.

These instances are fully borne out by the London, England, correspondent of the Toronto *Globe*, who, writing last week, says:

"It is most discouraging to learn that the packing of apples so far received this season from Canada is again in many cases dishonest. Two or three layers of very fine fruit are put at each end of the barrel and the remainder is trash, As has been often enough pointed out before, every person who buys a barrel of such fruit is a good customer spoiled. It cannot be too strongly stated, and should be brought home by every possible means to those interested in Canadian produce business, that the one thing above all others which the Englishman never forgives is being cheated in this way by fair appearances, and the shortest and sharpest road to the ruin of Canadian trade with this country is to allow such dishonest practices to flourish unchecked."

The time for definite action has come. Moral suasion, exposure, warning or threatening seem to be without avail, and nothing will put a stop to these dishonest practices other than the strong arm of the law. Let that be brought into requisition at once, and if there is any possibility of finding out who these fraudulent individuals are, let punishment in keeping with the offence be meted out. We cannot afford to adopt any half-way measures at this stage of the game. The reputation and the very existence of our export trade is at stake. But in addition to this there is a grave danger of this reacting on Canadian trade with Great Britain in other lines, to its lasting injury.

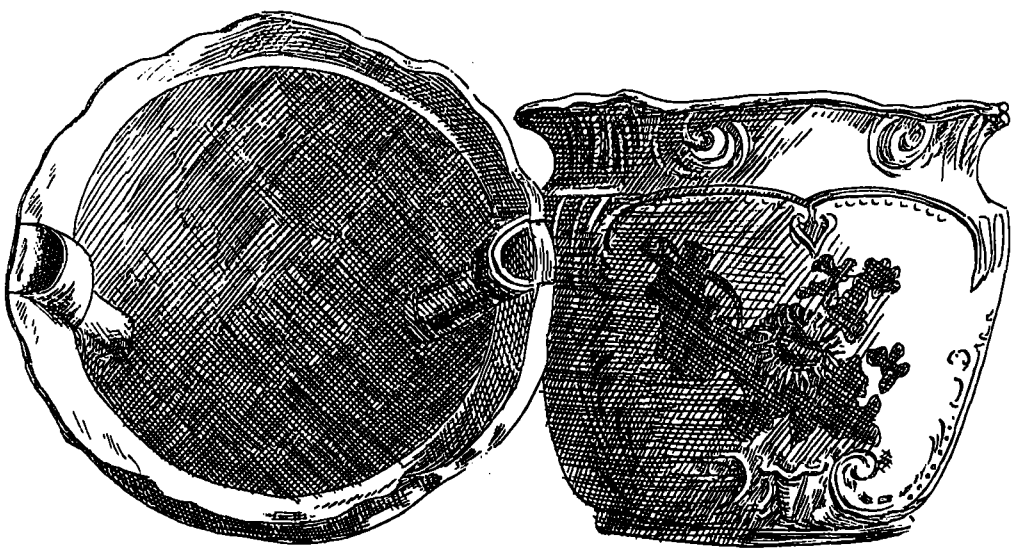
We are quite aware of the difficulties that will have to be encountered in enforcing the law and in locating the guilty parties. But the nature of the offences and their far-reaching consequences are such as to merit immediate action, no matter what the cost may be. We have stringent laws in this country, to prevent the manufacturing of "filled" cheese or "bogus" butter, which are enforced without any difficulty, and it is our proud boast that not a pound of spurious dairy-products is made in this whole broad Dominion. Let the same effective measures be adopted in connection with our apple trade and we shall soon hear very little of these fraudulent practices.

A few years ago, on the recommendation of the Dairy Commissioner, a scheme was put into effect whereby every cheese factory or creamery in Canada could register and receive a number to be placed on every box of cheese or package of butter shipped from that factory. Some similar arrangement might be carried out in connection with the apple trade, only make the legislation compulsory. Either this, or allow no apples to be sent out of the country without the packer's name and address are stamped in plain letters upon every barrel. A method of registration by which the packer could register his name and address and

receive a number to be stamped on the barrel might be simpler. But it makes little difference what is the nature of the measures adopted so long as they are effective in putting a stop to this dishonest apple packing. Unless it is put a stop to or in a large measure curtailed, it would be better not to ship any apples at all out of the country. Honesty in Canadian trade is too valuable a commodity to be allowed to be tampered with by a few unscrupulous apple-packers.

Farming.

gated pots is always loose and friable, instead of being hard or sodden and mossy, and impervious to the atmosphere. The system of sub-irrigated drainage has lately been applied to the forcing of vegetables and flowers in the United States, the benches being cemented, bottom and sides, and watered through pipes reaching above the soil surface. The practice gives such perfect results that already practically the whole of the market growers for Boston and New York have adopted it throughout their houses. The reports of Messrs.



The Toogood Sub-irrigated Pot.

THE TOOGOOD SUB-IRRIGATED POT.

Messrs. Toogood and Sons, Southampton, have had sub-irrigated pots in use for over a year with excellent results, and the sketch represents one of them. These pots are provisionally protected, a patent having been applied for. They are made of the finest and strongest ivory-white ware, relieved with a raised pattern, chased with fine gold, and variously decorated with elegant and lovely designs of lilac, pæonies, carnations, chrysanthemums, &c., in their natural colours. As regards the principle, it may be explained that by means of two pipes reaching from the top to the bottom of each pot, thorough æration is ensured, and all water is carried directly to the bottom, whence it rises by capillary attraction to the surface soil, as it would do under naturals conditions. The result of this application of water only directly to the lower soil is that the surface soil of sub-irri-

L. H. Baily (of Cornell) Rane (of the Virginia Agricultural Experiment Station), the Ohio Agricultural Experiment Station Staff, Green and other U. S. A. Department of Agriculture experts, all unite in praising the system.

The Poultry-Yard.

(CONDUCTED BY S. J. ANDRES).

FATTENING FOR MARKET.

The first essential in fattening fowls is to give more food, and this should be done three times a day until about ten days before the fowls are to be marketed. Bear in mind that you cannot fatten a turkey if you confine it in a coop alone. It will worry and lose flesh, instead of gaining, as it

prefers association. Feed the flock on a variety, giving corn and wheat morning and night, at noon allowing a meal of cut bone and meat. The turkeys will be in fairly good condition by the time they are to be penned, which should be about ten days before killing, put them in a small yard, having four or five together, and give as much as they can eat at a meal. After they are penned let the morning meal consist of two parts corn meal, two parts ground oats and one part ground meat.

A little crude tallow added will be an advantage. Also a tablespoonful of linseed-meal for each bird. At noon give wheat, and at night whole corn. Do not forget grit, water and scalded cut clover hay. S. J. ANDRES.

HATCHING EARLY.

The best hens for bringing out chickens are those of a quiet disposition. Some varieties will not sit for the purpose at all, such as Leghorns, Spanish and Houdans. In a domestic state, however, such varieties seldom get broody, which compels people who wish to breed from them to keep a few fowls of another kind to hatch their eggs. March, April and May are the best months to hatch chickens, but eggs may be set even in the warm months by those who have houses and wish to have well-grown chicks in summer for the fall market. The risk of losing the young broods, however, from lice is great, and the extra care and attention they require may not in ordinary seasons repay the trouble of rearing them. Some varieties can be very success-fully reared late, owing to the rapidity with which they grow to maturity. Leghorns are perhaps the fastest growers, often beginning to lay before they are four months old. If an increase of eggs is desired in the poultry-yard before large sums of money are expended in the purchase of good layers the pullets should be hatched early.

S. J. ANDRES.

LIME FOR THE SHELLS.

The gizzard can grind up the hardest material very fine; but to do this it must be assisted by gravel, shells, sand or other sharp-cutting material. These materials may pass out of the system unless dissolved, which can be done by the vegetable acids that separate the primitive elements of the various forms of lime. Bones are phosphate of lime, but egg-shells, chalk, limestone, oyster-shells are carbonate of lime. They are insoluble in water, and cannot be appropriated by the hen until they are entirely changed in chemical composition by some substance that unites with them. Plaster is soluble, but may prove injurious if used freely. The best way to feed lime is in the grains, such as wheat, oats, buck-wheat and barley. Clover hay is rich in lime, and so are peas and beans. The action of mineral substances is mostly mechanical, but while they may be insufficient so far as providing lime is concerned, yet it is only a theory and they are really more useful as grit. Many persons have provided their hens with all the oyster-shells required, yet they laid soft-shell eggs! It can be considered, however, that the difficulty may be weakness of the egg-making machinery. An egg traverses quite a distance before it is surrounded by the shell, and hens are subject to many disorders. Overfat hens, inbred and sickly hens are those usually affected. S. J. ANDRES.

AN EGG AS A BIRTH CERTIFICATE.

We have heard, from time to time, of strange things being produced as evidence, but who ever heard of an egg as a birth certificate? In the December number of "Little Folks" a writer says:—Mrs. Bell, a poor widow of Norwich, was brought before the School Attendance Committee of the city where she lived, in order that she might satisfy the powers that her daughter was old enough to produce evidence of her child's age, she showed the Committee an egg finally coloured in purple, yellow, and cream, on which were traced out in white letters the girl's name and the date of her birth, in addition to the texts, "The Lord shall guide thee continually," and "Teach me to do Thy will." This unusual birth certificate, after having received its meed of praise for the beauty of its execution was accepted by the Committee as satisfactory evidence of age, and the widow retired having proved her case.

GREEN FOODS FOR WINTER.

To use clover chop it finely, steam by covering with boiling water and wrapping it tightly to retain the heat for several hours. Then, after draining off the surplus water we have a dainty winter appetizer that all poultry revel in. All the so called roots—turnips, potatoes, etc—come into use in the regular morning mash, as they are boiled and mixed with ground grain Every cultivator of these crops has "seconds" of little value that he saves to feed to his fowls, and parties who raise nothing of the kind themselves can purchase their supplies at a low figure every fall.

S. J. ANDRES.

A GARDEN FOR POULTRY.

The poulterer on the farm possesses every advantage over the man confined to one or two city lots. While, in our experience, free range of the farm is not the best to raise fine poultry, yet we duly appreciate the foods that can be raised and fed fresh from the gardens to the hens. In our experience the fowls at large do not confine themselves to picking up the waste but rather choose to take their rations from the horse mangers and big troughs. They fatten on the corn and perhaps the men complain with justice "that the hens eat their heads off." We find it much better to have yards of medium size, and we have about come to the conclusion that hens at large are not much improvement over hogs at large and what woman or farmer's wife can put up with hogs in the door yard? But if hens are yarded they must be fed and there is room on the farm to plant a garden for the chickens. The query is what shall we plant? We should sow lettuce, of course. One can get quite a surprising amount of feed from a few feet square of lettuce; then these is the giant southern mustard. A few rows of that and you have a green food which is greatly relished and in sufficient quantity to supply a good sized flock. Then too perhaps we can find a corner for hemp and sunflowers. Then we must have some vegetables for winter. Cabbage and artichokes come first. Watch your hens eat raw artichokes if you do not think they will like them and see the chicks devour them. Then you may raise some carrots to cook and mix with bran for the hen's winter breakfast to make her lay. You can cook them and mix with corn meal to fatten the poultry quickly for market. Probably no vegetable you raise give less trouble or is more certain to give a good yield than sugar beets (or mangels. ED) Both beets and mangels are good keepers. Put the beets through the bone cutter and feed raw. The hens greatly relish the raw vegetables and the ducks must have them if you wish eggs for, in January. The mustard, I am told, will stay green long after frost, and when it is gone begin on the beets.

The mustard will not appear (so says an American breeder) the second year, nor in any way resemble the old fashioned sort. A great many spaces where the vegetables have been taken off may be sown to the mustard for fall feeding.

S. J. ANDRES.

The Flock

SHEPHERDS IDENTIFYING SHEEP.

IN "Seasonable Notes," page 36, Professor Wrightson writes :—"The Wiltshire shepherd is generally bred to the work from earliest infancy, and knows every ewe by sight as well as a huntsman knows his hounds. He soon knows the lambs as well, and this extraordinary power of individual knowledge of the entire flock produces a feeling of wonder in the uninitiated." This I can fully confirm, for the same knowledge as between shepherd and flock prevails amongst the Herdwick sheep which pasture on the mountains in the English Lake district. Some thirty years ago I was present at a preliminary hearing before magistrates for sheep stealing. A farmer's son was the delinquent and few persons could bring themselves to believe him guilty, Some shepherds were ultimately taken to Barrow-in-Furness, and in the slaughterhouses of the butchers there they picked out both live sheep and the skins of those that had been slaughtered as belonging to the flocks of their employers. When in the witness-box one of the shepherds was under cross-examination, after having given his evidence, by the defending solicitor :—

Solicitor : "What is the number of your flock?"

Shepherd : "From five hundred to one thousand."

Solicitor: "And do you think the bench are so foolish as to believe your statement that you can recognise each of those sheep when you see them away f om the flock? Such an assertion is an insnlt to the magistrates. How do you know tnem?"

Shepherd: "How do you know your friends, and how many people do you know?"

Solicitor: "You have no right to ask me questions; but to show the folly of your contention, I will answer you. I was born in the district, and know some hundreds of persons, recognising them by their features, of course."

Shepherd: "And I was born amongst sheep, and I know every one of my flock by their features just as certainly as you know your human friends."

The solicitor tried to ridicule the claim, but the chairman, the late Mr. Montague Ainslie, J.P., D.L., assured him it was correct. The prisoner was committed for trial, and afterwards to a term of penal servitude.

It has been further claimed by shepherds that their dogs can distinguish the sheep of their own flock from those of others. On one occasion I accompanied a relative to an extensive common to bring down for winter twenty sheep which had been on the common during the summer. The neighbouring farmers had each a right of sheep, pasturage on the common. Arrived there, he sat down. lit his pipe, and invited me to do the same. He then told the collie to go for the sheep. Before the pipes had been smoked, the dog returned with twenty one sheep, only fifteen of which were ours. My companion remarked that the sheep had got mixed, the dog had been unable to separate them, and had brought them to us to do so. We singled out the six, and the dog was sent off with them; in some fifteen minutes Spy returned with our five sheep. R.

THE VALUE OF THE PRIZE MUTTON SHOWN AT THE PROVINCIAL WINTER FAIR.

The production of good animals of national importance.

The following letter has just reached us from Mr. Wm. Davies, president of the William Davies Company, pork packers and export provision merchants, one of Canada's most important and greatest national industries:

THE WILLIAM DAVIES COMPANY, LIMITED.

Toronto, Jan. 24th, 1900.

F. W. Hodson, Esq., Ottawa. Ont.

DEAR SIR, — Mr. Flavelle hat suggested to me that I should give you my experience in eating the prize mutton. I bought a leg and two loins and the meat was excellent. It was surpassingly fine. Of course we had to cut off most of the very thick fat, but the lean was rich, juicy tender, very fine in the fibre, and in every respect a great treat. I imagined this was from a Shropshire or Southdown sheep. I afterwards bought two loins and they proved very unsatisfactory. The meat was dry, the fibre coarse, the bones large and coarse, and the fat anything but nice. In the case of the first, the fat was rich and tender. I think the last must have been a Costwold or a Leicester. While the first we had was very much superior to anything we can buy in the ordinary way, the second was inferior to the best that we have in the regular course of business.

I thought this would interest you. Of course all lovers of good mutton know that the Downs are much superior to other breeds.

Yours truly,

(Sgd.) WILLIAM DAVIES.

Lambs scouring.—Will your veterinary adviser kindly suggest treatment for lambs under two weeks old with scour? For several years past, in a Shropshire flock, I have lost a large percentage of lambs dropped, more especially during the latter half of the lambing season. The ewes have corn and clover chaff, with a limited supply of roots, on sound grass land. Change of roots or corn for the ewes does not arrest the complain, which carries off the lambs suddenly, often within twelve or twenty-four hours of the commencement of the attack, which is generally accompanied by griping pains?—J S. [Immediately a lamb is attacked with scouring give ½ drachm of bicarbonate of soda dissolved in half a wine-glassful of water. Two hours after this give a good tablespoonful of linseed oil, and again follow this with ½ drach of bicarbonate of soda, 3 grains of salicylic acid, ½ drachm of laudanum, ½ drachm of tincture of ginger given in a little cold flour or starch gruel three or four times a day. It is often advisable to give the dams 1 ounce of Epsom salts and I drachm of bicarbonate of soda in ¼ pint of

water every alternate day, and allow them access to rock salt to like as they choose. Care is required in drenching such young lambs with medicines, as they are easily choked when being forced to take nauseous liquids.] —*Ag. Gaz.tte.*

PROPER WAY TO FEED LAMBS.

Peter Jansen, the great Western sheep feeder, says:

From a very small beginning, some twenty years ago, the business of fattening sheep for the butchers has become a gigantic enterprise. The most important point in starting to feed sheep is to buy the right kind and at the right price. The three important things in feeding sheep are a dry feed lot, pure water and plenty of good feed; and, as a fourth essential I would add regularity and good common sense. With these anybody can make fat sheep. Whether he can make money in feeding them is not quite so sure. After getting the sheep they should be thoroughly dipped for scab, and where a long feed is contemplated they should by all means be dipped twice, from ten to twelve days apart. The operation of dipping is now so well known that it is not necessary for me to enter into the details, but it should be done thoroughly. Opinions differ as to the dip to be used.

I am careful to start my sheep very slowly on grain, giving them about a quarter of a pound at first, with all the roughness they want, gradually increasing the grain and decreasing the rough feed. It takes about thirty days to get them on full feed, and I believe it is a good plan never to overcrowd their appetites, especially when they are to be fed four or five months. When on full feed grown wethers will eat from one and one half to two and one half pounds of grain a day; lambs somewhat less. If it is possible, a mixture of oats, shelled corn, bran or oil makes a splendid ration. But this is often not practicable on account of the high price of some of these ingredients. I have made very fat sheep on nothing but clear, shelled corn and wheat straw. It takes from three to four bushels of grain to fatten a sheep, and we figure on ten tons of roughness for 100 sheep during the average feeding season. I feed them grain three times a day, and roughage twice—morning and evening. Of course, they must have plenty of good clear water. I keep salt before them always.

PRICES FOR BACON HOGS.

The improvement in the live hog market during the week, though slight, will come as a relief to farmers who have turned their attention largely to raising hogs for the export bacon trade. Some think the improvement should have come a week or so sooner, and if the market here is governed by the condition of the current English bacon market it certainly should have come earlier. Those who followed at all closely the market review published every week in FARMING will have noted that two weeks ago we quoted a cable report showing an advance of 2 s. per cwt. in the English bacon market. This was followed last week by a report showing another advance of 2 s, making a total advance of 4 s. during the past three weeks. This coupled with the statement that stocks were low and that holders were not pushing sales, would indicate that if the live hog market here were influenced by the fluctuations in the English bacon market we should have had an improvement in prices at least two weeks ago.

In an excellent article on the bacon trade published in the Gazette Department of FARMING last week, Mr. J. W. Flavelle, manager of the Wm. Davies Packing Co., Toronto, is represented as stating that the Canadian packer has to regulate the prices paid for his hogs by the probable condition of the English bacon market six weeks later. If this be true, then the advance of last week is due to an expectancy of higher prices for bacon about the middle of January. Mr. Flavelle emphasized the fact that there was no secret understanding between packers in regard to the buying prices for hogs. His statement that the basis landed in England the last two weeks in September which represented hogs marketed during the first and third weeks of August, cost 47 s 6 d. and realized 46 s. 5d. would seem to show that our packers are losing money very fast.

However this may be, it is not likely that such a condition continues for any length of time. At the prices that have been paid for choice bacon hogs during the past month or two we are inclined to believe that there is more money in the business for the packer than for the farmer.

In the article referred to appears a statement that better prices have been paid for hogs at Buffalo and Chicago than were paid by our packers. This is something that is really hard to understand, in face of the quotations for Canadian and

American bacon in the English market. Hodgson Bros, Liverpool, in their bacon market report of November 18th, quote as follows: "Singed Wiltshire, Canadian, 45/55 lbs., 40 to 42s; American, 40/50 lbs., 35 to 37s." Here we have a difference of 5s. in the price of Canadian and American, and yet choice Canadian bacon hogs have been bringing lower prices than the best American hogs. If the American packer can afford to pay $4 to $4.25 for hogs and make money out of the transaction, Canadian packers could afford to pay at least 10 per cent, more for live hogs, and still have a good profit. This is how the situation strikes us in making this comparison of values. There may be other conditions affecting the Canadian hog market that we know not of.

Mr. Flavelle's remarks in regard to the large percentage of fat and soft bacon are worthy of note. That during four months of the year faulty stock should average one-third of the whole is a serious matter, indeed. From this it would seem that we are not making much advancement in breeding and feeding the bacon hog. The losses given of $1.65 on soft bacon and $1.25 on fat bacon for each pig are large, indeed, and that these could be saved by proper feeding is something that our farmers should remember. It will be interesting to compare the losses on fat hogs with the prices paid for choice bacon hogs and fat hogs. Last week the quotations on the Toronto market were: Select bacon hogs, $4 25; thick fats, $4, and light fats, $3.75 per cwt. Here we have a difference of only 25 cents per cwt. in the prices for bacon and thick, fat hogs, while there is a difference of $1.25 per 95 lbs. in the prices for choice and fat bacon. Of course, it must be remembered that the figures Mr Flavelle gives were based upon the prices for hogs a few month back, when the difference between the prices for bacon and fat hogs was much greater. But even so, we hardly think that the average difference in the prices for the hogs in the time referred to would equal the average difference between select and fat bacon in the English market for the same time.

We draw attention to this matter because we are still convinced that our packers do not make the difference they should in the prices paid for select bacon and fat hogs. There has been an improvement this year over last, however, but taking one season with another the premium paid for select bacon hogs of the right stamp is not large enough. If our packers desire to secure the best quality of bacon hogs they must be prepared to pay a good premium for them. There is no doubt something in the statement that the packer cannot tell the hog that will make soft bacon from the good one when buying This is a condition that our farmers can remedy by proper feeding. Though much has been said and written about breeding and feeding the bacon hog it is evident that we are yet far from having solved all the problems connected with the business. The industry is an important one, and everyone connected with it should put forth his best efforts to get at the bottom of the matter.

Farming

The Apiary.

The Beginnings of Beekeeping.

L. F. Abbott, Maine.

The beginner will find that his time has been well occupied if he will work a few weeks or months with some practical bee man and learn his methods. Books will help him, but upon many points they will be silent. The information they lack can easily be obtained if you are associated with a successful beekeeper.

Do not start in with many colonies of bees the first year. One to five is sufficient, two about right. It is important to choose the right hives at the commencement. Of course they will be movable frames. Always select hives with movable bottom boards. For years stationary bottom boards to hives have been used, but for several reasons they are objectionable. Two very essential things cannot be done satisfactorily with the fixed bottom boards — requisite ventilation in hot weather, and proper cleaning out of the hives in spring, when the weather is too cold to warrant opening the hives and removing the frames for that purpose.

Whatever style of frame is chosen, have them all alike, because in the various manipulations of the hives as time goes on, it will be found convenient and often necessary to change frames from one hive to another. This cannot be done when different sizes are used without great inconvenience and loss frequently. Nor will the appurtenances of one style of hive fit another. A variety in hives is a constant source of trouble and expense.

Do not pay an extravagant price for bees to start with; $4 to $6, according to the season of the year, is sufficient. In spring a strong colony known to have a good laying queen is worth $6. Hives may be moved a mile or more at any season without much if any loss by bees returning to their former stand, but much less than this distance will occasion more or less loss. It is better to purchase bees in fall or spring. If bought in the fall, ascertain if they have a good-looking queen. They might and might not have some brood, depending somewhat upon the time. Then the bees can be taken home and cared for during the winter to your liking. But if the purchase is deferred until winter, better wait until the bees fly in March or April, or the weather is warm enough to open the hives and ascertain their condition. A colony without brood by the 15th of March I should fight shy of. Either its condition is weak or it has a poor or no queen. If bees are seen carrying in full pellets of pollen when the willow catkins are in bloom, it is good evidence that the colony has a prolific queen and is in good condition. Such a swarm, if there were considerable numbers of bees flying on a warm, sunny day, I should not hesitate to purchase without further examination.

Do not heed the advice of some well meaning people who advise the novice to purchase bees in box hives and transfer them to movable frames, because such swarms can be bought cheaply. One might make a success of the job, but 10 to one he would make a failure and become disgusted with beekeeping at the outset.

Moving Bees in Winter.—Sometimes it is desirable to change the location of the hives or to remove them from one side of the yard to another. This may be done any time during winter, for the bees fly so seldom that they will forget the old location and adapt themselves to the new. Carry them very gently, so they will not know that they are being disturbed.

Twenty-five or thirty pounds of honey will winter a colony of bees and give them a good start in breeding up in the spring until the maple trees bloom again. Do not confine the bees to the hive during the warm days in winter when the temperature is 50 degrees or more. They need an occasional night.

During winter all extracted (or more commonly called strained) honey will granulate. If in glass packages a most excellent way to reliquify is to place the jars on the dining room register for two or three hours, when the honey will come back to its original state, without soiling labels or removing covers from jars.

One-Pound Sections Best.—If the farmer intends to sell his honey, he should have the bees store it in one-pound sections, but if he wants it only for his own use, larger boxes are just as good.

N. Eng. Homested.

Commerce.

THE BALANCE OF TRADE.

(*From the Journal d'Agriculture*).

While waiting for the appearance of the trade-returns of 1899, which will help us to study together the remarkable agricultural movement now present before us, I think I shall be devoting my leisure to a useful purpose and, at the same time, responding to the unexpressed wishes of the readers of LE JOURNAL D'AGRICULTURE, if I try to elucidate certain points which frequently present themselves to the mind and appear obscure to the eyes of many of them.

For instance; it is often said that for a country to be prosperous, it must have the "balance of trade in its favour: i. e., that it must export more than it imports, sell more than it buys, because in that case it has no money to lay out, but, on the contrary, it has itself to be paid in money. That is the general idea; the idea most commonly held; but as it is an erroneous one, the prejudice of a by-gone time, no pains too great can be taken to eradicate it.

Positive conclusions can be reached by us on this point without our being obliged to devote ourselves to a deep study of political economy. At starting, we have only to apprehend thoroughly that coin is not wealth, but only its representative (*image*), and, moreover a representative that is not invariably faithful to its pledges, as we shall see later.

Next, it is an error to suppose that the balances in foreign trade are always paid in coin. Even

war debts, due from one nation to another, are not paid in this way; for, in 1871, when France had to pay over to Germany the enormous sum of a thousand million dollars, it was but a very trifling part of this that changed hands in money.

For, in truth, the precious metals play no leading part in the payment of international debts. The imports and exports of gold are but insignificant affairs to a country when compared with the figures of its trade. It is very seldom that a country possesses more of the precious metals than it needs for its circulation and for use in the arts; and there is never so much gold exported as shall diminish in any alarming proportion the amount required by the demands of the circulation. On the other hand, it is indubitably the interest of a country to retain no more gold than its trade requires.

The reason for this is very simple. In the one case, if there is a rather excessive exportation of the precious metals, the rate of interest rises at once, the price of goods falls, importation suddenly finds itself hampered and exportation stimulated, so that the equilibrium is soon re-established. In the other case, the comparatively trifling surplus of gold that remains in the country over and above the demands of its circulation, causes the rate of interest to fall, raises prices, restrains the exportation and stimulates the importation of goods, and thus creates rapidly a road for itself into foreign countries, where its value is greater.

Money is like water: it will always find its own level. It is like those pumps (*à balance*) that one meets with in the saloons; when the equilibrium is interrupted, a value opens, the liquid escapes, and the level is restored by its own proper action. The normal level of currency is automatically regulated by the demands of the circulation. When the amount of specie is insufficient, its value rises; when it is in excess, its value falls, and it escapes now inwards, now outwards, according to the case. So, it is clear that the exports and imports of gold from one country to another are governed by far other causes than the payment of international debts.

Thus, if it be admitted that no deficiency or surplus of the amount of specie required by the demands of the circulation can be anything but trifling and temporary, it must be concluded, as a necessary consequence, that the balances due from one country to another are liquidated, directly or indirectly, by goods and not by money payments, except occasionally, and then only in a very small proportion.

The truth of this proposition can be more easily seen by an instance drawn from our own trade. Since 1868, the Dominion has constantly had, except in 1880, the balance of trade against it, i. e., it imported more than it exported. It is only during the last five years that the proportion has been reversed; since 1895, we have been exporting more than we have imported. In other words, according to the common notion, the balance of trade has been in our favour. Does that mean that the balance has been paid in specie? A short examination of the figures will easily show the absurdity of this claim.

I will, first of all, take the period from 1884 to 1894, during which Canada bought more from, than she sold to, the foreigner. Here are the figures, in round numbers of millions:

	Total Exports	Total Imports	Exports of gold
1884	91	116	2
1885	89	108	2
1886	85	104	—
1887	89	112	—
1888	90	110	—
1889	89	115	2
1890	96	121	2
1891	98	119	1
1892	113	127	2
1893	118	129	4
1894	117	123	2
	1075	1284	17
		1075	

Excess of imports..... 209 millions.

If the surplus of our purchases during that period had been paid for in money, we should have had to disburse 209 million dollars. Now, the total amount of gold we really sent out of the country was only 17 millions, besides I do not take into consideration the imports of gold, which in reality are very small. It is therefore quite clear that we must have paid for the surplus of our purchases otherwise than in money.

And this is still more convincingly shown by the figures of the period we are now considering:

	Total Exports	Total Imports	Exports of gold
1895	113	110	4
1896	121	118	4½
1897	137	119	3½
1898	164	140	4½
	535	487	16½
	487		
Excess of exports	48		

According to those who hold the theory of the balance of trade, we ought to have received $48,000 000 in specie; far from that, we exported, during these four years of prosperity, almost as much gold as in the eleven previous years, when we were indebted to other countries.

This apparent anomaly admits of only one explanation; it is that, while we were getting better prices for our commodities, the accumulation of specie in our coffers exceeded the demands of the circulation to such an extent that it was found necessary to send some of it abroad, where the value of money was greater than at home.

As all debts must be paid in some fashion or another, either in money or in produce, nothing can be clearer than that, if the balances of trade are not paid for in specie, they must be paid for in goods. Commerce is purely a matter of exchanges, and money is nothing but an ingenious instrument invented for the purpose of facilitating the exchange of commodities.

(Signed) ULRIC BARTHE.

(From the French; by the Editor).

At the North Dakota Station some interesting experiments have been carried on re the vitality of the typhoid bacillus in milk and butter. The butter used in these investigations was derived from an ordinary creamery, and contained one ounce of salt per pound. Ten days appear to be the longest period of time over which typhoid bacili introduced direct into butter could be detected. When, however, the cream was infected with typhoid germs before churning, the latter was discovered in butter even after three months old. Typhoid bacilli do not, apparently, make any marked growth in butter if the buttermilk is thoroughly worked out of it. In sterilized milk typhoid bacteria can exist for upwards of four months. Where milk is inoculated with typhoid bacillus it will take almost complete possession of the liquid, becoming almost a pure culture.