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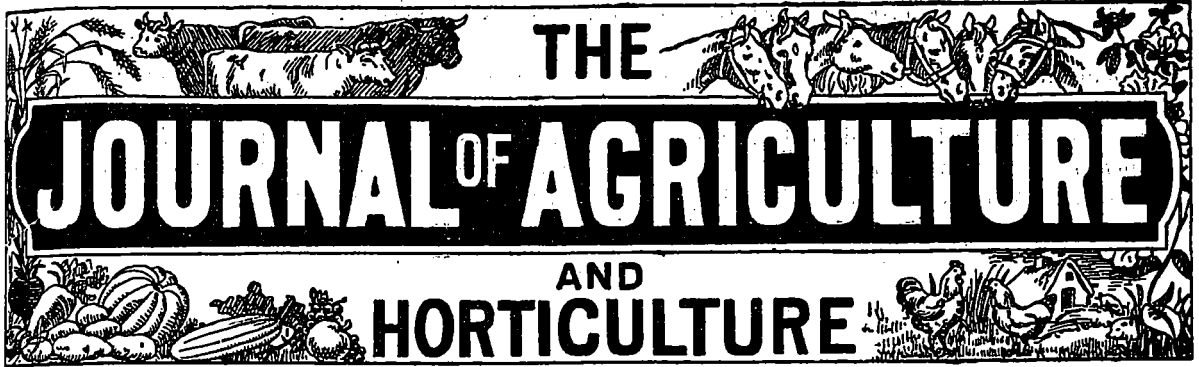
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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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- THE -
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Table of Contents

THE FARM	
Basic-slag	169
Shallow vs. deep ploughing.....	169
Beef-prices.....	170
Potatoes.....	170
Manures.....	171
State of the crops, Macfarlane on the.....	172
A model stock-farm	173
THE GRAZIER AND BREEDER	
On breeding.....	174
Baby-beef.....	176
SWINE	
Pig-feeding problem	177
To check hog-cholera.....	178
Prof. Murray on swine.....	179
THE HOUSEHOLD	
Summer-gleanings	180
Recipes, etc.....	181
THE FLOCK	
Points of the sheep	182
GARDEN AND ORCHARD	
Provincial Exhibition, 1899	183
THE POULTRY-YARD	
Pure breeds on the farm.....	184
Poultry on small farms	184
The most valuable poultry.....	185
THE DAIRY	
Creamery management, Parry on	187
Cheddar-cheese, W. R. Gilbert on.....	189
Competition of milch-cows.....	192

The Farm.

NOTES BY THE WAY.

Basic slag.—We do not wish to depreciate the value of basic slag as a phosphatic manure on certain soils, but we must say that the price of it, such as we find advertised in one or two pamphlets we have met with lately, is a great deal too high.

In the *English Agricultural Gazette*, basic slag is quoted at, for the best quality, 36 shillings, or \$8.64, a gross ton of 2,240 lbs., which is equal to \$7.71 a ton of 2,000 lbs.; and yet the price charged for it, here in Montreal, seems to be \$25.00 for the smaller weight. Surely, it cannot cost \$17.29 a ton to bring this valuable commodity over from Liverpool! If such charges are common in the trade, it is not a matter to be wondered at that so little use is made of artificial manures in this country. But, we suppose the same law rules in this case as in the case of insurance of farm-stock; few people, comparatively, insure their crops and buildings, because the rates of the Insurance Companies are so high; and, conversely, the rates are so high, because so few people insure.

Shallow vs. deep ploughing.—As we were born and brought up in the county of Kent, England, we need not tell those of our readers who are familiar with the agriculture of the dear old "Garden of England," that we are a devout believer in deep-ploughing.

As we have been informed of late, by two or three persons in a position to know what they are talking about, that shallow ploughing is being practised, as a rule, at the Ontario College of

Agriculture, an example that is likely to be followed at the Ottawa Experiment-farm, we should be very much obliged to Mr. Shutt, or any other of our correspondents, if he or they would be good enough to explain to us the utility of this novel practice, and the principles on which it is founded.

The murdered cows at Toronto.—The name of the American firm, whose cows were murdered at the Toronto show, has been published, together with the childish inadequate punishment awarded to them for their cruel and dastardly act. But we, and doubtless many of our readers, have been surprised at not meeting with an exposure of the Canada firm that was guilty of the same atrocity. Will not the managers of the Toronto exhibition enlighten us on this point, or are the culprits so highly placed that they must be allowed to escape the chastisement due to their crime? As for the suspension from the exhibitions for the space of a twelvemonth, that is too trivial an award. The guilty parties should never be allowed to show cattle again at any place in the Dominion.

Beef.—Early last month, 28 bullocks were sold in Chicago market for \$6.85 a 100 lbs! Hardly necessary to say that these beasts were of the finest quality and were intended for the New York butchers. No such price has been heard of since the year 1892, and even in that year, the high price paid was for Christmas beef. The average weight of the lot we are speaking about was 1,495, so we may put the carcass weight down as something like 975 lbs., or 120 London stones, in which market the bullocks would, at present prices, have probably fetched £27.00 a piece, equal to, say, \$130.00; the same, sold in Chicago, yielded about \$102.00. Would the balance, \$28.00, pay commission, freight, insurance, etc.?

Potatoes.—The average yield to the acre of potatoes in the United States is, we believe, something like 85 bushels. Our own product is some 20 to 25 bushels higher than that of our neighbours. We think we do pretty well in England if we turn out six tons, or 240 bushels, but what are these yields to the magnificent crops dug on the estate of Lord Rosebery, at Dalmeny, Scotland, the average yield of which is never under 18 tons an acre—720 bushels! Scotland, on the whole grows

larger crops of potatoes than England; and no wonders if the farmers of the former country manure as lavishly as does Lord Rosebery, on whose farm the usual dressing for potatoes begins with 30 gross tons of dung, ploughed down on a clean stubble in the fall, and followed by 448 lbs. of "ground" lime, grubbed in early in the spring, and 448 lbs. of superphosphate, 112 lbs. of fermented bone-meal, 112 lbs. of sulphate of potash, 112 lbs. of muriate of potash, and 112 lbs. of sulphate of ammonia, applied in the drill at planting time! And the seed, too, is, just such as we plant in the South-East of England, good-sized, uncut tubers.

Of course, a good deal of the dung used is the "police-dung," from the town of Edinburgh, and not up to the quality of the cake and pulse fed dung of the "byres." Still, the dressing is enormous in bulk and, no doubt, costly in acquisition, and we hope it pays. Even after the great crop of potatoes has been taken, we should almost expect the following grain-crop to "go down," and yield a poor sample of grain. As to the potash, would it not be better to spread that on the fall-furrow after the dung is interred? It takes some time for this element to become fit for plant-consumption. Can potash dressings be needed on land that must be so choke-full of it already?

A very instructive table is that published in the Report of the Agricultural Department of the Glasgow Technical College. Experiments were tried, simultaneously (1898), to see if artificial manures could be partly used in the place of dung, which varieties would answer best, and in what quantities. In the table, "potash" and "nitrogen" mean 112 of the former, and in the latter case, 112 of sulphate of ammonia, and "phosphate" means, 448 lbs. of superphosphate.

Manures per acre.	Average produce.	
	Tons.	Cwt.
None.....	4	14½
Twenty tons of farm manure.....	9	15
Ten tons ditto.....	8	4
Ditto and potash.....	8	12
Ditto and phosphate.....	8	12
Ditto and nitrogen.....	8	14
Ditto with nitrogen and potash.....	9	2
Ditto with nitrogen and phosphate..	9	5
Ditto with nitrogen, potash and phosphate.....	9	12

When 143 lb. of nitrate of soda replaced 112 lbs. of sulphate of ammonia, the yield was a little less, except where potash and phosphate were used with it, as well as farm manure, and in that case the yield was the same. The advantage of using potash, phosphate, and nitrogen in artificials with the half dressing of farm manure is clearly shown in the table, the yield being only 3 cwt. less than where 20 tons of farm manure were applied, whereas when anyone of these fertilisers was omitted, the yield fell off considerably. The experiment was admirably arranged.

We see that where no manure of any kind was applied the yield was $4\frac{1}{2}$ tons, equal to 180 bushels an acre, about twice the average yield of the States.

WHERE MANURE WILL DO MOST GOOD.

In some plants the farmer wants a large root, large stem and large leaf; and in others he wants only the seeds,—the other parts being an unimportant and secondary consideration. An abundance of plant food, an excess of it if you will, early in the life of the plant, makes for the growth of roots and stems and leaves; and then after the plant is about full size, some difficulty in getting more of it, makes for the growth of seeds. If a man wants large turnips let him pile on the manure. You never saw too much manure on a turnip field, for the size of the turnips. That is quite unlike the bunch of oats on the dung-hill. Then you never saw a hay field overmanured, so far as the growth was concerned. In the hay you want the stem and leaf; and in the turnip and mangel and carrot you want the root; therefore, manuring is the right thing for them. Besides their period of growth and accumulations extends many weeks after the period of collection by ripening cereals has ended; and that at a time when the farmyard manure applied that season is most readily available; and when nitrification in the soil is most active.

There is a fundamental principle to guide in making a rotation of crops,—apply manure only for green crops and hay; and follow these by cereals sown in soil having a very fine tilth, since for them there is only a short growing season. That the first part of it should be favorable is most important for the yield of grain.

Application of farmyard manure directly for grain crop is almost always a wasteful practice,

but put on for root or other green crops it puts and leaves the soil in the best condition for grain to follow. I do not contend for sowing grain on poor land, but for putting manure on for green crops and for grass and for hay, which take all the nourishment they require, and leave enough, and that in the best condition, for the growth of the succeeding crop of grain.—*Prof. Robertson before Agricultural Committee, House of Commons.*

WHAT IS COW MANURE WORTH!

If all the liquid and solid excrement of a cow is saved, it will make, with enough straw to absorb it, about a two-horse load per month—such as farmers usually draw from stables and barnyards to the fields. This manure is already on the farm, and it ought, therefore, to be worth more than in a city or village stable, where it has to be drawn several miles before it can be applied to the land. On the other hand, the farmer who draws manure from a city, fixes up a wagon box that will hold fully twice as much as any load of produce that he takes from the farm to the market. A dollar a load is the usual price paid for these large loads, when contracted for by the year. In the summer, when manure piles in the city are a nuisance, manure from cow stables will be sold much less than this. We have known it offered at fifty cents a load, and in extreme cases have seen it given, free of cost, to whoever will take it away.

Market gardeners, who buy most of the manure from city stables, say that these large loads are necessary, for the manure is unfermented. By the time it is rotted down and ready to apply to the land, its bulk is reduced fully one half. They do not like manure from cow stables, so well as that from horses. It is slower to heat, and contains less phosphate and nitrogen than the average manure from horses. This is partly, perhaps, because oats are the common grain food of horses, but are less frequently fed to cows. Besides, when a cow is giving milk she puts more of the nitrogen into the milk pail than the horses use. But when cows are fed clover hay, while the horse has timothy, and the cow has, besides, a ration of wheat bran daily, her excrement will be nearly, or quite as good as that from a horse. The whole question about the value of different kinds of manure, depends more on the feed than on the stock. A first-rate cow, with a good digestion,

able to eat heartily, and fed some linseed meal with wheat bran and clover hay, will make manure that will be worth three times as much per load, as that from a cow that is fed mainly on straw.

We often see statements in farm papers, that the manure from a cow per year is worth nearly or quite as much as her dairy product when made into butter. But it must be a very poor cow, indeed, or one fed extravagantly, of which this can be said. Much of the manure of a cow that is at pasture, is scattered in the fields, and as it ferments, it is wasted in the air, doing very little good to the land whereon it falls. Instead of its being worth \$40 to \$45 a year, \$20 would be a liberal estimate for it. In most cases the addition of five dollars worth of phosphate and the same of potash, would more than double its effective value. This, however, will not be needed where the cow, in addition to her other feed, has had grain or meal that is rich in both nitrogenous and mineral plant food.—*American Cultivator*.

Good advice.—Dr. Grignon says that the farmers at Ste-Rose du Dégelé sow 3 bushels of grain to the arpent, equal to $3\frac{1}{2}$ to the acre. This is a great improvement on the absurdly small seedings generally met with; though it is about right for oats, it is too much for wheat, if the land is in good fettle.

More sheep should be kept, he says.

At St. Louis du Ha! Ha! the curé says he is trying to persuade his flock to sow more root-crops, such as mangels, swedes, etc.

Nitrate of soda.—A most extraordinary piece of advice, connected with the above manure is mentioned in the JOURNAL D'AGRICULTURE for September 22nd. "M. Grondeau advises farmers never to spread nitrate of soda on the surface of the of the land after the plants are up; it should be ploughed in at the last ploughing."

Probably M. Grondeau has spread nitrate of soda on a crop of young swedes or mangels in damp weather, and found the plants scalded. Dry weather should be chosen for this work. As for ploughing down so soluble a manure as nitrate of soda, practice and theory are both opposed to it.

STATE OF THE CROPS. FALL PLOWING, ETC.

To the Editor of the JOURNAL OF AGRICULTURE.

Dear Sir,—Now that the season is about over, we can see how the crops have turned out, summarize them and make comparisons. The grain crop upon the whole is a good fair one, in some sections better than usual, while in others not so good, prices are higher than for some years at this time of the year. Buckwheat has only been lately harvested and seems to be rather better than usual.

Corn.—This crop turned out fairly well, but how this grand fodder is wasted each year. This is now the end of September, and many of my neighbors have not got their corn cut yet, they may never cut it but turn the cattle into eat what they can, and tramp the rest into the mud. Corn should be cut early before the frost damages it, even if there are some few green ears; by saving the ears for seed that ripen first, in a few years you will have corn ripe fully 2 weeks sooner than if you pursue the usual way. When cut early, and properly stooked, corn fodder is really excellent, especially for milch cows, of course, the best way of all to save corn fodder is to put it into the silo.

Potatoes are an excellent crop far better than the average, and of very fine quality. It is about the only produce of the farm selling at a moderate price, selling in the market to-day at about 35 to 40 cents per bag, not much rot so far.

The other root crops will only be a fair crop.

Apples.—This crop is turning out much better than at first anticipated, the fruit is so large this year, that there will be a great many more apples shipped than was thought possible some time ago. Prices being high will also bring out many more than if the price were only half of what it is. Those who persisted in spraying last spring and took the pains to kill the caterpillars, will get something for their labors now. I had a practical lesson on the benefits of spraying: my neighbor, who does not believe in it at all—his apples trees are just on the other side of the fence and were not sprayed—you can find many apples spotted on his trees, while it is a rare thing to find one in mine with a spot on it. They were sprayed 4 times last season, I drew his attention to it, but still he is not fully convinced.

Hay.—Take the province of Quebec as a whole, there is a good fair crop of hay; some sections far better than last year, others not so good, very little clover, the quality of the timothy is very superior to anything we have had for some years, and the price is nearly double of what it was this time last year. On the whole, farmers should be well pleased with the quantity of hay and grain in conjunction with the price—and should make some money.

Cheese.—Perhaps there will not be quite so much cheese made this year as in the last 2 years, but the prices are away up to the good old times of 11 and 12 years ago. On account of drought in Great Britain, the prices have been quite remunerative here all the season, going up by leaps and bounds, until 12 cents has been paid quite freely. The shipments to date are away ahead of any past year, so that, looking at it from a practical standpoint, as there are few held in cold storage, the position is a strong one for the price to be maintained.

Butter.—Canada's name for butter has been forging ahead at a wonderful rate this year; our make has been large, and the shipments a long way in advance of last year, though last year was a record year, and the price has now reached 24 cents per lb. for choice mild creamery.

Farmers should feel happy these days; grain a good crop and a fair price and the same remark will apply to hay, cheese and butter all you can make at big prices; eggs, dear; horses, likewise; apples, a fair crop and big prices; make hay while the sun shines is a good motto, so make all the money you can at present. There is quite a good start made towards getting the *fall ploughing* done: a good deal turned over for September month, the recent rains will help those who had stiff land to plough, it will enable many to go right on now and get it all done this fall. All clay soil should be fall-ploughed; sand does not matter so much. I have not heard of any ploughing matches advertised to take place—next month October is the month for those.

Yours truly,

PETER MACFARLANE.

Chateauguay, 30th Sept. 1899.



A MODEL STOCK FARM VISITED.

A little over seven years ago Mr. Robert Reford, of this city, bought 320 acres of land adjoining the village of Ste-Anne de Bellevue, with the view of making a model stock farm. The tract of land formerly comprised several homesteads, and the soil is of considerable variety in texture, and the way it had been cultivated was not by any means along lines which now indicate successful farming. Under the skilful management of Mr. James Boden this uncouth tract of land has been transformed into about the most beautiful to be found in the province, and the outbuildings are not excelled in outward appearance as well as in the inside arrangement by any homestead in the Dominion.

But the principal attraction on the Reford farm is the herd of pure bred prize-winning Ayrshire cattle which adorn its pastures and decorate the interior of its cattle stalls. Eleven head of these beauties have lately been sold at rather remarkably high figures and sent to various places in Ontario and Manitoba to raise the standard of dairy cattle in the more progressive farming sections of the Dominion. There are still on the farm about 60 head of Ayrshires, old and young, eight of which had been imported from Scotland. Several of these cows are now given 45 to 50 pounds of milk daily, although the hot weather and numerous vicious flies help to make cow life rather too uncomfortable for good milk production.

The cows, when brought to the stable evening and morning for milking, always find a tempting ration of bran and some kind of green forage awaiting them, which helps to atone for the shortness of the pastures and assaults of the horn-flies at this season. There is a twenty-acre field of corn just behind the G. T. R. station, and extending down almost to the bank of the river, which stands about ten feet in height, and which, notwithstanding the protracted drought which has prevailed there since early spring until last Monday evening, still will produce from twenty-five to over thirty tons to the acre. The Swedish (1) turnips, and also the carrots, give promise of an abundant yield, but the drought was too much for the mangolds, which look as if they had been blighted, there being so many drooping and withered leaves among them. There is a field of

(1) Should be "Swedes"; the swede is not a turnip.
Ed.

alfalfa clover (1) which is now making a good show for a third crop of fodder. There is also a field of green barley and rape growing together, which Mr. Boden is trying as an experiment for a change of horse feed. The milch cows get their present daily lunch taken to them from a field where corn, oats and vetches had been sown broadcast, and although the corn made a poor growth, the oats and vetches have turned out wonderfully. Some fifty or sixty steers are fattened here every winter in a building where they are permitted to run loose, and get their feed placed in mangers round the sides.

Yesterday two of the staff in charge of the experimental work on the Central Government Farm at Ottawa visited the Reford farm, and, in company with several other gentlemen interested in agricultural matters, including the vesteran agricultural journalist, Arthur Jenner Fust, visited and examined the various departments of the farm, including the dairy and poultry buildings, and all expressed themselves as being exceedingly pleased with the appearance of the farm, its buildings and its live stock, which are a tribute to the efficient manager, Mr. James Boden.

Witness.

The Grazier and Breeder.

ON BREEDING.

(BY THE EDITOR.)

The problems connected with this subject are numerous and intricate. For example—why is the produce of a Dorking cock and a Cochin hen, quite different to the produce of a Cochin cock and a Dorking hen? It is so, and remark, that the difference, though more or less various in quantity, is constant in quality.

Why, again, in the mule, is the produce of the male horse and the she ass utterly distinct from that of the stallion donkey and the mare? So different, indeed, is one from the other, that there is a distinctive name for it in England, viz. the "Hinny," the mule being, almost invariably, the offspring of the male ass and the mare; the "Hinny" being very seldom bred.

Once more; there is the well authenticated account of the thoroughbred bay mare. This

animal, whose pedigree did not contain one ancestor whose colour was in the least degree mixed with white—gray thorough-breds being extremely rare, so rare that, during a pretty long experience on the turf, the writer only remembers three or four—was accidentally, served by a gray cart horse, to the intense disgust of her owner. The foal was bay; but seven succeeding foals, all got by bay, or brown, racing stallions, had, every one of them, more or less, stains of white in their coats!

As to the original whence our domesticated animals spring, there can be little doubt that, as in the case of wheat, and other cereal grasses, they have been fostered and cultivated by the hand of man, until the rough progenitors of our modern Devons, Kyloes and Herefords, have, in the persons of their descendants, become the smooth, finished pictures we now see at our exhibitions.

These are *races* as distinguished from the *breeds*: we may talk of the Devons as a race, but the term cannot, with propriety, be applied to the Shorthorns; it requires only a glance at a herd of the former to see that, from their colour and general conformation, they have never been mixed with other stocks, whereas, the latter bear evident marks of having been, so to speak, created by the wit of man out of an amalgamation of selected specimens of various kinds, until a type, previously fixed upon by each separate improver, has become fixed and determined.

We need hardly say, that the first person who formed the idea of originating a *breed* of domesticated animals which should be superior to the native *races*, the *aborigines*, was Robert Bakewell, of Dishley. He began with the sheep; which, rough and ragged, small and ill-shaped, as was the stock then bred from, he succeeded, by patient selection and considerate matching of parents, in improving into the "New Leicester." The horned cattle of his neighbourhood, for he wisely chose the animals nearest to his hand, next felt the magic touch of his genius, and became the modern "Longhorns," highly esteemed in the pastures about Leicester and Rugby; prizes being not very long ago given by the Royal Agricultural Society for the best specimens of the breed.

Stirred up, we may well suppose, by the fame of Bakewell, the brothers Colling next appear on the scene. They, fortunately, for us as for themselves, had better and more abundant

(2) Lucerne. Ed.

material to work upon than had their predecessor. Contemporary with the Collings, but working quite independently of them, came Thomas Booth, of Warlaby. Somewhere about 1790 this gentleman having observed that the valley of the Tees was depastured by a fine, roomy stock of cattle, conceived the idea of improving them. The defects which he aimed at suppressing were an undue prominence of hip and shoulder point, a general "soda water bottle" appearance, too much *daylight* under the belly, and a want of uniformity in laying on flesh evenly and firmly all over the frame. Selecting a few cows from the herd of a tenant of Lord Harewood Mr. Broader, of Fairholme, and coupling them with moderate sized bulls, Mr. Booth succeeded in laying the foundation of his son's still celebrated herd, many of the most illustrious families of modern Shorthorns owning their descent from the Fairholme purchases. In pursuance of his plan of moderating the general looseness of build, then one of the most observable defects in these Teeswater cattle, the founder of the Warlaby herd was greatly aided by bulls hired from the brothers Colling; amongst others to *Hubback*, *Albion*, and *Twin Brother to Ben*. We shall see, presently, how these animals were bred, and what was the effect of their peculiar line of blood.

The principle upon which all these earlier breeders went was the well known one, that "like produces like"; an unfailing principle, truly, but one which admits of a far more general application than is generally allowed, and should be regarded not only in the coupling of the sexes for the propagation of the inferior animals, but also in the continuation of the human species. If more attention were paid to this rule by our heads of families, we should not have so many idiots and consumptives among us. Nature always avenges an infraction of her laws.

But, while it is perfectly true that "like produces like," there is another rule that steps in to teach us caution; and that is the tendency of all animals to "throw back" to some remote ancestor, whose probably forgotten points suddenly make their appearance in one of his descendants. This is called "Atavism," and is frequently observed by the breeders of white pigeons, who, in spite of all their pains to keep their birds pure in colour, find constantly, to their trouble, that black feathers will show themselves in the young ones. (1)

(1) Darwin.

Here then we find the rule established; that it is not sufficient that the immediate parents be of fine shape, good colour, and robust constitution, but they must be descended from families, who, for generations, have boasted of these desirable qualities, if we are to hope for an offspring that shall not disappoint our expectations. This point we shall have occasion again to touch upon when we come to speak of in-and-in breeding.

The form aimed at by all breeders is the solid figure known to mathematicians as the parallel-pipedon. A carpenter's pencil will give a good idea of this figure to non-mathematical readers: it is contained by six sides, each of which is a parallelogram. Its proportions are not only beautiful in themselves, but they contain a large capacity of contents within small dimensions. As to colour, that is generally a mere matter of fashion, though, probably, red indicates robustness of health, and, in cows, to a certain extent, richness of milk; but there is no rule, as many a Shorthorn breeder will testify. The strangest thing is that, although there is no doubt that the early breeders crossed their stock with the Galloway, and although there is more than a suspicion that the herd of one very prominent Durham-man was indebted for its rugged coat and peculiar horns to the Kyloe, the appearance of a black nose would throw great doubt on the purity of the descent of a modern Shorthorn. We say nothing about the black hair for, of course, they were to canny to cross with any but dun-coloured Galloways and Kyloss, of which there are plenty.

And now comes the question, how did the originators of our new breeds propose to keep up their improved herds, or what was their practical work in the matching of their animals? And this brings before us the whole subject of the two opposite systems—breeding *in-and-in*, and *crossing*; a subject of deep interest to us at all times; but, now that we may expect a permanent demand upon our fields and sheds for meat of good quality for exportation to Britain, it may truly be said to involve the question of riches or continued poverty to this Province.

Let us see then, in the first place, how Bakewell proceeded. It is notorious that, after he had succeeded in establishing the type he set out in search of, he could never be tempted to make use of a strange animal, however enticing might be its

orm or quality: he bred entirely from his own stock. (1)

Mr. Booth's reply to the advice of a friend of the writer who had recommended him to introduce foreign blood into his herd was conclusive: "I will, if you will tell me where to find as good." What do we see in the breeding practice of the Collings? Take the before mentioned bull Albion, for instance; he was got by a bull who was both the son and the grandson of *Favourite*; his dam was by a son of *Favourite*, and his grandam by a son of *Favourite* out of *Favourite's* half sister!

"Charles Colling's bull Bolingbroke and his cow Phoenix were brother and sister on the sire's side, and nearly so on the dam's side. They produced the bull *Favourite*, and he, put to his mother Phoenix, so nearly related to him on the sire's sides, got Young Phoenix. To this heifer *Favourite* was again put, and, she being his daughter and his *more than sister*, the calf was—Comet!" (2)

Here we have in-and-in breeding with a vengeance! Many a man would say that sterility must ensue, and so perhaps it might if the practice were continued, or if the signs of a falling off in the masculine character of the bulls were neglected. But in the hands of such breeders as we have mentioned there was no fear of this taking place.

(To be continued).

BABY-BEEF.

The older the season gets the more clearly it is being seen that there is likely to be a great scarcity of cattle for the feed lots this fall and for market as well. Shrewd Western feeders in the States saw this shortage coming and commenced last year to prepare for it by feeding baby beef. The great success of lamb feeding led to the thought that calves could be made a source of as good a profit, and at the same time furnish as toothsome a delicacy as the lamb, if the youngsters were taken and given all the alfalfa they could eat, together with a topping out on corn, and linseed meal.

Particulars of one of the first bunches of calves put up to feed for baby beef have just been made public. They were fed at H. Collin's Colorado.

(1) Jonas Webb did the same with his Southdowns. Ed.

(2) Storer—Comet was the first "Thousand guinea bull."

Of a bunch of 70 the following are the particulars: At the time the calves were placed on feed in December the heifers weighed 412 lbs. and the steers 413 lbs. March 7 the heifers weighed an average of 516½ lbs. and the steers 519½ lbs. and one steer which did not get in with the bunch, 570 lbs. On April 7th they averaged 572 for the heifers and 579½ for the steers, with 680 for the odd one. May 7th the average was 632 for heifers, 644 for steers and 740 for the odd. June 7th the weights were 695, 712 and 832 lbs.

Before they were placed in the feed lots they were contracted to be made to average 700 lbs. or over at some time in June, and were to be paid for at the rate of five cents per lb. at the yard, the animals to be fed as usual in the morning and shut away from feed after 8 o'clock, the weighing to be done at noon of the same day, so that the feeder stands none of the shrink incident to shipping to the river markets.

The method of feeding was to put the calves in the pens in December last and at once begin giving them all the alfalfa they could eat, together with a small quantity of bran and corn shop, mixed half and half. As they became more accustomed to the grain, the ration was increased in quantity, and the proportion of bran decreased until it was 1-6 and the corn 5-6. During the last month 1 lb. of oil meal per day was added to the feed, and Mr. Amos, the feeder, considers it a valuable constituent of the ration.

Another lot of 93, fed by a well-known feeder of the same place, were fed along the same lines as the above lot, except that he used no oil meal, and instead of that fed potatoes during February, March and April, with a grain ration of 10 lbs. per day, which was increased to 13 lbs. for the last month. While the potatoes were being fed the calves did not eat nearly so much of the alfalfa, but took a great deal of wheat straw, seeming to prefer it to the hay, and when the potato feeding ceased they went back to the heavier hay ration. These animals averaged in January 481 lbs. On April 24th they averaged 656½ lbs., and on May 24th, 730, a gain of about 2½ lbs. per day. On the last date one of the steers weighed 825 and another 880 lbs., all of this lot being steers.

The prospects at present are that a large number of calves will be fattened in this State this winter. In the first experiment one-half of the calves were from the Texas range and the other half from

Utah. The feeder could see no difference in the gain made by the two bunches. They were all Hereford and Shorthorn grades.

We don't need to go so far away from home, however, to get an example of profitable feeding along this line. At the Brandon Experimental Farm last year one of the grade cows produced a pair of twin calves from the service of a Shorthorn bull. They were raised by hand, and weighed at eleven months old 850 lbs. each, and a butcher offered four cents a lb. for them, or nearly \$65 for the two calves before they were a year old.

What The Farmer would like to know is, why cannot our farmers fatten their own calves during the winter and sell them in the spring as baby beef, instead of for stockers? The difference in the price obtained for these animals would surely make a good profit for feeding them.

N.-W. Farmer.

Swine.

PIG FEEDING PROBLEMS.

In our last issue "Hay Seed" asked questions as to the feeding of damaged wheat in combination with buttermilk, and the value of cooking that wheat. These questions can only be settled with any degree of exactness by reference to the now, fortunately, rather numerous records of trials made at experiment stations, and as they are of real practical interest to every feeder, we again take up the subject. It is pretty well known already to every well informed feeder, that a growing animal takes more out of any kind of feed than one approaching maturity. Variety is another point to be taken into account. A continuous diet of any one thing, however excellent, is sure to give unsatisfactory results, and the intelligent feeders who carried out these tests have, as far as possible, combined the foods given in such a way as to secure a balanced ration, involving the least possibility of waste of any of the component parts of the feed. Reference will be made to this point later on.

We refer to Professor Henry's work, "Feeds and Feeding," for most of the information that follows. It must be understood that he is an experimenter of ripe experience, capable of sifting out of his own and other men's work the vital features and throwing out all cases whose

authority is doubtful. In five feeding trials conducted by himself, Professor Henry found a slight gain made by cooking the feed. In other ten the result was the other way and he found no case out of many elsewhere in which cooking did any good. The conclusion to be drawn is that cooking is not conducive to thrifty digestion and tends to waste. Ohio (in winter) showed 21 lbs. greater gain for 270 lbs. less corn in a test extending over 112 days between cooked and dry corn.

All the tests collected averaged 6 per cent of actual loss from cooking. (1) Perhaps, as we noted in the reply to "Hay Seed," the cooked feed was quickly gobbled up and therefore less mixed with gastric juice than was the case with dry feed that had to be well masticated.

Experience at four stations goes to show that 451 lbs. of grain, after being soaked, made as much grain as 483 lbs. fed dry, or an average of 7 per cent. in favor of the soaking. Grinding gives about the same advantage over whole grain as soaking over dry feeding. The above noted experiments were all made with different blends of feed, corn being the principal ingredient all through.

Perhaps the fact that cooking versus dry feeding causes loss, while soaking works the other way, may be accounted for by the soaked feed being more slowly eaten than if it were cooked. Mere appetite is no adequate test for the amount it is desirable to feed. Corn fed steers for example, get into the way of eating much more than they can properly digest and hogs are usually put in the feed lot to pick up a living from their droppings.

Many experiments go to show that a mixture of corn meal and shorts is one of the most profitable rations for pigs that can be used. Barley meal, especially, when used with skim milk, has long been the favorite blend with English feeders, and on this side is equally good. (2) Bran is a very unsatisfactory feed for young pigs—far inferior to shorts, no matter how mixed with other grains, and it is irritating to the bowels, often causing scouring.

Skim milk in moderate quantities combined with corn, frozen wheat, barley or shorts, is of special value. It helps to make a balanced ration

(1) In *Britain*, it was decided, by practical men, fifty years ago, that cooking food for pigs did not pay except in the case of potatoes. Ed.

(2) Finish off *hogs*, not small *porkers*, with pease. Ed.

along with corn, that in the States will turn out cheaper pork than any other food grown. If three pounds or thereabouts is fed with each pound of grain there is a much larger proportional profit than when larger quantities of milk are fed. Every careful test, and ordinary observation as well, goes to show that to feed pigs of any size with milk alone or with little other food is a very wasteful process. Professor Henry's own experiments go to show that with corn at \$12 per ton, two or three lbs. of milk fed along with each pound of grain, will produce a value of 18 cents per 100 lbs. for the milk, while if 8 to 10 lbs. of milk is given with each pound of grain, the value of the milk will be only 11c per 100 lbs. That is—the less milk we feed daily, the more profit does the pig take out of what it does get.

In a quite recent bulletin of the U. S. Department of Agriculture reference is made to an experiment made by C. P. Goodrich in which 56 lbs. of corn made 10 lbs. of pork and 100 lbs. of skim milk 5 lbs. of pork, while the same quantity of each when mixed made 18 lbs., an increase of 3 lbs., attributable to the mixing. By this test, with corn at 40c., 100 lbs. of skim milk was worth 30c. feed value—too high for business feeding.

A similar experiment at Utah is referred to in the same bulletin. To make 100 lbs. of grain with corn alone it took 79 days with grain and milk; 116 days with grain alone and 147 days when the feed was milk alone. In this case 100 lbs. of skim milk took the place of 23 lbs. of corn. The conclusion reached by the writer of the bulletin is that "when not more than 4 lbs. of milk is used with each pound of grain the milk is worth from 15c. to 20c. per 100 lbs. The younger the pig the more profit it will take out of the milk. It may be taken as a safe rule that it is profitable to pay at least 15 cents per 100 pounds for all the skim milk needed to make four times the weight of the grain fed and where it is impossible to secure enough for all the hogs the available supply should be given to those pigs nearest the weaning age and to suckling pigs."

This is in exact accord with what we said to "Hay Seed" as to the relative value of skim milk as pig feed.

There is a general agreement that sour milk is preferable to sweet skim milk for pigs. (3) Careful

(3) The celebrated "Arthur Young," more than a hundred years ago, built ten tanks in which to sour his skim-milk, as he had proved, to his own satisfaction, that pigs did better on sour than sweet milk. Ed.

tests show that buttermilk has the same feeding value as skim milk, always provided it is not diluted with water before it reaches the pigs.

N.-W. Farmer.

TO CHECK HOG CHOLERA.

Prof. Henry says Isolation or Quarantine in the Hope of Farmers.

An East Troy, Wis., correspondent, of the Wisconsin Experiment Station, writes concerning hog cholera and asks if there is any method of inoculation or vaccination which is practical and efficacious, and Prof. Henry offers the following suggestions:

"On more than one occasion notices have appeared in the public press stating that the Department of Agriculture, Washington, had a method of inoculation or vaccination, to prevent hog cholera. In reply to a letter addressed to the department by the writer, we were informed that such statements were premature, though hopeful experiments were in progress. Wisconsin farmers may rest assured that as soon as anything positive is accomplished in this much needed direction, the public will be promptly and fully informed of such help.

"For the present the hope of farmers in staying the dread disease must rest in isolation or quarantine. In all veterinary matters the state of Minnesota is a dozen years ahead of Wisconsin. There they have a powerful board of health which is working vigorously in this matter. As soon as hog cholera breaks out, the premises where it appears, are put under the strictest quarantine according to modern ideas of what is proper. As a result, hog cholera is surely being driven out of the state. The Minnesota state board of health saves its costs to the people many times each year.

"In Wisconsin we have a state veterinarian, who is doing the best he can to check the plague, but he is cramped for means and for assistance. Until our farmers wake up in this matter, affairs will drag along as they are now doing, with enough money lost every year to pay for a dozen state veterinarians."

"If hog cholera breaks out in any locality in Wisconsin, I urge our farmers to write or telegraph immediately to Dr. H. P. Clute, State Veterinarian,

Marinette, Wis., urging his immediate presence. Dr. Clute will come to the premises as soon as possible and no doubt place a quarantine thereon. Farmers are urged to carry out the orders of the veterinarian in regard to the quarantine in all particulars.

"The disease is often spread by sympathizing neighbors who come to look over the sick animals and give their opinion as to whether it is hog cholera or not, and to offer some of the many cure-alls which everybody has to recommend. Those visiting the premises carry away the disease on boots and clothing. Wagons passing over the affected districts may carry the disease on the wheels. Rats are also conveyors of the disease germs, as are streams of water. Prevention is better than cure, and no matter how good a preventive we may hope to have, we should at once educate ourselves in the untold value of strict quarantine systems. In Europe, the great cities have now reached a stage where they longer dread Asiatic cholera. It is not because they found a remedy for Asiatic cholera, but because they have learned how to quarantine against it and prevent its spread.

"The writer of this reply believes that if Wisconsin was to spend a few thousand dollars each year, for a few years, on hog cholera quarantines, the state would soon be rid of the disease, and once free from it, we could, by the same system, carried out relative to stock brought into the state, keep the losses down to an insignificant sum. When once our farmers are thoroughly educated as to the great values of quarantine, the knowledge so gained will be helpful in many ways. Such knowledge would aid in suppressing diphtheria, scarlet fever and other plagues among human beings. We would also be prepared to act quickly and intelligently when new contagious diseases attacked our farm animals."

ADDRESS BY MR. J. A. McMURRAY

Of the Ottawa Experiment-Farm.

(From the French).

As I told you, we have from 100 to 110 head of horned-stock at the farm; among them, there are the large breeds you were shown yesterday, the Holsteins, Shorthorns, Ayrshires, Canadians, Guernseys, etc. Now, when I speak to you about

the *Canadian Cow*, you must not think I mean the registered Canadian; I mean the Canadian cow, such as one sees in most of your cowhouses in the Province of Quebec.

We have a piggery too, with from 50 to 80 pigs in it; there are pigs of the improved breeds, and common pigs, such as you keep.

Why do we keep all these breeds, do you ask? To make experiments on the way in which they fat, breed, and do for crossing.

What breed do we need to answer the demands of the market to-day? If you want to make bacon in connection with dairying, and choose Chinese or Berk-hires, you will not succeed; you will make pork for the shanties. The trade does not want that sort of pork to-day. These pigs will make fat, but not the style of bacon in fashion at present, for the wants of to-day's market are very different from what they were ten or fifteen years ago; in those days, we wanted fat pork for the shanties, which was consumed in this country; now, we want a kind less fat and intermixed with alternate layers of lean; and for the production of such, do we need a special kind of pig? Yes, and the best kind is the one you have, your Canadian pig. An excellent cross, too, is one between a Canadian sow and a Tamworth or Yorkshire boar. These are the two great breeds that have the greatest power of transmitting their form. As soon as you put your small sows to one of these boars, you will have pigs just like the male parent; lank and lank. If you already have sows of the great improved breeds you can, without diminishing the quality of the meat, put them to your own young boars or to a Berkshires. The Berkshires are smaller, and quicker in growth; they come to their full size in 7 months. More meat can be made out of these large breeds, but their pork is not suited to the demand of the dealers. When you buy males, take care what you are about; tradesmen are of course always honest men, but for all that do not trust them. I advise you not to buy by letter; try always to see the animal before buying it. You can get these animals at the experiment farm; for though, on account of the losses through *tuberculosis*, we have had no cattle to sell for some time, we have many specimens of the different kinds of pigs.

I have advised you to ^{buy} your breeding-stock at the experiment farm because although you may have to pay more for it than from private breeders, you are more certain of getting that for which you

are paying. I do not say this as an advertisement, just the contrary. If I advise you not to make your purchases at the farm, it is because every animal that leaves us is a selected subject. No animal leaves the farm till it is two months old, and those that are not considered fit for breeding are kept for the butcher. We raise animals for breeding; we sell them at 8 weeks old, for eight dollars; if you want one of four weeks old, you will not be allowed to get it, so as not to send out to farmers anything but the best subjects. (1)

Now, we must reckon with natural defects; the boar you buy may turn out impotent; when you have tried him, if he does not answer, the Farm will take him back or change him for another. The object of the Farm is not to make money; you will not be told, as a dealer would tell you: it's not my fault. Such is the object of the Farm, that exists only for the assistance it can be to the farmer. So you will always do best in buying your stock at the Farm.

And now, recollect this: the pig, of all the animals, must be kept clean; this may seem droll to you, but, all the same, it is the very truth.

Dr. Grignon—You tell us that the experiment-farms were created for the purposes of helping the farmer; will you be the intermediary between this meeting and the Farm to get us pigs rather cheaper. There are, breeders, at Oka and elsewhere, who only ask 5 or 6 dollars a piece for theirs. It seems to me that if the experiment farms wish to help the farmer, they would sell their pigs for that price, and I think the Dairy-men's Association will approve of my idea. I see well enough that this would be entering into competition with the breeders of boars and sows, but it would be doing a service to the greatest number.

Mr. McMurray—Yes, that is true: I am quite ready to do what you ask, but it would be better for the Association to pass a resolution to that effect. The Farm does not do these things to make money; the farms are not ours or the government's, they are yours; they belong to the provinces of Canada; the people paid for them; they are your property; so, we must keep ourselves above criticism and all ideas of competition. Now, you pay us a visit, you will say: there's fine calf; you offer us twenty dollars for it, and you won't get it; an hour, perhaps, afterwards, comes a but-

cher, and he gets it for a dollar and a-half! Why? Because the calf was not in every respect what a good breeding animal ought to be. You see we do not speculate; we are not allowed to deal in that way.

Were we to put our animals on the same footing as other breeders, we should be competing with them, and as farmers always have more confidence in the stock of the Farm than in the stock of private men, that would cause trouble. Look at eggs, for instance: you pay a dollar for a dozen eggs for hatching, and yet you can get the same eggs for 15 cents a dozen for eating. Why? because for hatching, only the eggs of the best breeds are chosen; and if the eggs prove infertile, the seller will, next year, either give you others or let you have them for half price.

To return to our pigs, I may tell you that whenever Farmer's Clubs have bought any from the farm, they have always turned out well.

In order to succeed with pigs, they must be kept warm, but not too warm though, and receive plenty of good but not too rich food. The hog is a greedy beast; he eats, as the saying is, "like a hog;" he eats so much that, if you give him enough, he will kill himself. He wants food enough to fill his belly, but the food must not be too rich. Don't let your pigs run about round your buildings in winter; you know well how the pig befouls things; besides, they feel the cold and suffer from it. They must be kept indoors.

(*Trans. by the Editor.*)

(*To be Continued.*)

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

SUMMER GLEANINGS.

During my summer outing I have come in contact with many, and various experiences.

Not the least of which is the development of the people and country I have been in the habit of visiting for the last 15 years.

In the early days, these people were uncouth and very suspicious of town's folk, scarcely thought them worthy to be trusted with one of their dear, old sleepy horses, till they held the dollar bill in their hands, and the horse still living to earn more

(1) The word "subject" (*sujet*), used instead of *specimen*, is one of the myriad of French words retained by the Scotch. A. R. J. F.

for them, and may be more carefully driven than the owners were in the habit of doing.

I might remark here there are visitors who, were I the owner of a horse, I should never let them have one a second time, this kind of person only wants to get the dollar's worth and will drive the poor beast up and down hill without mercy, bringing the poor thing home hot and exhausted, and this is called fun!

Fifteen years ago one had difficulty in getting a good supply of onions.

To-day there is a constant supply of good vegetables of every kind, for the growing of which the soil is well suited it being sandy and very fertile.

This is done by the French farmers' wives, who are not afraid of working in the soil, providing they get a modest return for their labour.

I have never eaten better carrots of the stump rooted sort anywhere although there were people who thought them too sweet being accustomed to the earthy taste of the long ones.

Lettuces, French beans, pease, and turnips could always be had.

One farmer was very proud of his vegetables as he had got a little smattering about gardening. They certainly were superior to his neighbours'. Then, when the wild fruit was finished, came in a good supply of fine garden strawberries, to be had at a very fair price.

All these, with the sale of butter and eggs, make a little item to help on and encourage the great industry of the French Canadian, and also will help to show the thriftless ones what industry and perseverance will do.

We have taught these good folks to sow a succession of peas, beans, and salad, and we reap the benefit by getting them for nearly the whole season; also, we will not buy scalded chickens, it is a lazy way of plucking them and spoils them for eating.

Now, as we cottagers, between 50 and 60 in number, represent a good share of the visitors, it pays farmers, as they learn every year, to treat us well.

The driving is done partly by the proprietors of the various hotels and boarding houses, with a good share left for many of the farmers for miles round; this, coupled with the payment for opening and closing of our cottages by the latter,

brings into the household of the same a good, round, certain sum every year, and has helped them to buy machinery to serve in the better cultivation of their farms.

If this prosperity goes on the dear old place will deserve a higher sounding name: to us it will always remain, dear LITTLE MÉTIS!

RECIPES, ETC.

CLEAR VEGETABLE SOUP.

Thoroughly cleanse and prepare in the usual way three or four carrots, turnips, leeks and onions, then cut them all up into small, neat dice, sprinkle them lightly with fine white sugar and salt, and fry them in a small quantity of butter until they have acquired just a very little colour, after which drain carefully, and put them into a saucepan with from three to four pints of good white stock, the latter being of good flavour, and very clear and bright looking. Boil all together gently until the vegetables are sufficiently cooked, then add some cucumber rings, and some French beans cut in lozenge shapes, both of which have been cooked separately, and when the whole has once more reached boiling point, serve as already directed.

BOSTON BAKED BEANS.

Procure one quart of small soup beans, wash thoroughly, and soak in cold water over night. Next morning drain, cover them with fresh cold water, add a pound of salt pork, bring to boiling point, and boil until when you blow on them the skin will crack. Drain and put into a bean-pot. Score the rind of the pork, and put it down into the beans so that the rind only will be exposed. Dissolve one teaspoonful of salt, a quarter of a teaspoonful of mustard and a dash of pepper in one cup of hot water; pour this over the beans. Now pour over two tablespoonfuls of molasses, and add sufficient boiling water to just cover the beans. Cover the pot with a saucer and bake slowly in a moderate oven for six or eight hours.

WALNUT PICKLES.

Gather white walnuts when sufficiently tender to pierce with a needle; put in a stone jar and pour boiling brine over them; let stand ten days. Drain, and place in the air for six hours. Soak in cold water over night. Cover with cold vinegar and let stand thirty-six hours; pour off and cover

with a gallon of hot vinegar, to which has been added seven ounces of ginger, seven ounces of salt, two heads of garlic, a tablespoonful of scraped horseradish, two pods of red pepper, half an ounce each of ground mace, cloves, allspice and orange peel. The vinegar should be strained.

A CHUTNEY, SAUCE, OR RELISH FOR MEAT.

Take for ingredients six or seven large sour or sharp apples, three or four large tomatoes, three large onions, 6ozs. sultanas, one teaspoonful ground ginger, one dessertspoonful salt, one saltspoonful red pepper, one dessertspoonful anchovy essence, one dessertspoonful Indian soy, one table-spoonful salad oil, and one pint and a-half of vinegar. Chop up the apples and onions very finely, cut the sultanas one across. Put all the ingredients except the vinegar into a mortar and pound them well together, then by degrees add the vinegar, which should have been boiled previously and allowed to get cold. When all the ingredients are thoroughly well blended together put them into wide-mouthed bottles and cork closely.

CANNED CORN.

To 8 lbs of corn cut from the cob, add one ounce tartaric acid. Dissolve the acid in about one teacupful of boiling water and add to the corn after it has been well cooked. Stir well and let it boil again 10 minutes. Then it is ready for canning. Tin cans are the best, but must not be old or worn off. Glass cans will do, but must be sealed tight and kept in a cool, dark place. When preparing for the table, pour the corn from the can in clear water, rinse well and place in a kettle in clear water. When about to boil, add to each quart of corn one teaspoonful of soda, let it boil until the corn looks yellow. Then drain the water off and mix with sweet cream thickened with a little flour. Add a little butter and salt and 1 teaspoonful sugar.

GARDEN CHAT.

Pull the tomato vines before frost, hang them in an inclosed shelter and keep all the earth possible about the roots. They will ripen the green fruit nicely.

To make house plants grow, Professor Boosof says: Saturate the earth around them every day with the coffee left over at breakfast. Five or six

drops of ammonia to every pint of water once a week will make them flourish. To make bulbous flowers blossom, fill a flower pot half full of quicklime and the remainder with good earth, plant, bulbs and keep the earth dam. The heat of the lime, tempered by passing through the earth, will cause the bulb to send forth shoots to blossom. The colors of red and violet flowers are rendered extremely brilliant by covering the earth in their pots with about one-half inch of pulverised charcoal. Charcoal does not affect yellow flowers at all in this way.

Try this when putting away summer clothing, prevention is the best cure.

To Prevent Moths Attacking Clothes.—"Place a piece of common rock brimstone, just as it is, in your box, or chest, or wardrobe, and the moth will never come near any woollen goods. This I have tried," he adds, "for many years in my business, and had stock of long keeping, but free from any moth. In my shop I simply laid a piece of brimstone on the shelves or fixtures, behind the woollens. I am firmly of opinion that if only one piece is laid carelessly in any room, moth will do no damage there, and have had 20 years' experience."

Go out of doors at least once a day on some fixed errand. The change broadens the mind—the fresh air invigorates the body. To no one is the advice more necessary than the housewife.

The Flock

POINTS OF THE SHEEP.

Old, broken-mouthed or, we may add, ruptured ewes, must go, and a faulty udder is, in most cases, an unpardonable defect. It is less easy to still further cull the flock of its less desirable members. Great judgment is required in culling out the weak members, but the opportunity must be taken, and no doubt rigorous weeding is one of the secrets of improving a flock.

A weak, bare, or badly-colored head, speckled ears, when a uniform color is in type, pink or badly-colored lips and nostrils, and spots where no spots should be, a rusty, sour, ugly head in any breed should be got rid of. It is no great

matter if we cull beyond our usual draft, as there are plenty of opportunities in early autumn to replace by buying a few good ewes.

Nothing looks better than good heads, and strange as it may seem, a sheep's head, which is only worth 9d. at the butcher's, is worth a lot of money when carried on a good ram or ewe.

Next to the head and ears we look for good necks. Ewe-neck sheep never look well, and a good scrag is a strong point. Let us therefore, as far as possible, weed out long or hollow-necked ewes. A muscular neck indicates strength of constitution, and good muscular development, and I have never known a sheep-breeder who did not strongly object to a shabby neck. Mr. Ellman, the father of the Southdown breed, insisted on the importance of this point. Mr. James Rawlence, of Bulbridge, one of the oldest of our noted breeders, would not keep a weak-necked ewe, and no man who values his flock would buy a ram with this fault. The neck ought to be muscular, arched, tapering and neat.

Shoulders are as important as neck, and should be considered as follows: First, they must blend with the neck. They must be well laid back so as to produce thick "crops" and a great girth. Secondly, they must be wide over the tops. Thirdly, they must be wide through the heart from blade to blade. Nothing can be more effective than a good fore-end. If you try to think of it, imagine the sheep to be grazing with her head towards you, and you will then notice the grand effect of good shoulders. Deep floor to the chest and a prominent breast, coming well forward between the fore-legs, complete this part of our picture.

Next let us look at the ribs and backs, the loins the quarters, the let-down of the legs of mutton, and lastly, at the general ampleness of form. There is no mistaking a good sheep, and when looking through a flock for drafting, every mean, undersized, bad charactered or defective ewe must go.

A good flock cannot be got up in a year, but each year tells. It is the object to take off the tail and put on a new and improved head to the flock every year, and thus to build up the ideal which every breeder carries in his mind's eye. This is drafting or weeding, and no successful breeding can go on without it.—*London Live Stock Journal.*

The Garden and Orchard.

(CONDUCTED BY MR. GEO. MOORE).

PROVINCIAL EXHIBITION, QUEBEC, 1899

The weather for the first three days of this Exhibition, which opened on Monday, the 11th of September, was anything but favourable, but cleared up on Thursday, when it might be said the Exhibition was in full swing, and was attended by large numbers of eager sight-seers from the City and surrounding country.

The different departments were filled up with exhibits. The Industrial Hall contained a large collection of manufactured goods, fancy work, musical instruments, and objects of arts. The Machinery Hall was full of agricultural implements from many of the leading makers, and there was a grand display of all sorts of vehicles and harness.

In the "Palais d'Industrie" a building, spacious, well lighted, and ventilated, was the display of agricultural and horticultural products, and most creditable it was, both to the producers and managers, who had seen that they were admirably arranged. What made the Exhibition the more interesting was the fact that, with few exceptions, the specimens and collections, gaining the principal premiums, were produced in the locality.

Mr. Verret of Charlesbourg was, as usual, prominent among the exhibitors of fruit and flowers, and he made a great addition to the attractions of the show by his elegant stand of the articles in which he deals, namely vegetables and flower seeds, honey, wax and beekeepers supplies.

He also exhibited fine spikes of some novel Gladioli, and a fine collection of that useful hardy garden plant, the perennial Phlox, in which was the variety Joan of Arc, a new one, which should be in every collection.

Dr. Gauvreau, of Charlesbourg, won the first prize for honey, which was beautifully clear.

Mr. J. Elder, of the Stanstead nurseries, brought a fine assortment of apples and pears, and secured twenty first prizes out of twenty-one possible. His specimens were excellent, well grown, and, what is a matter too frequently neglected in Exhibitions, and which ought to be insisted upon for educational purposes, were correctly named.

Plants with ornamental foliage, palms, several varieties of cut-flowers, and a beautiful floral design shown by Mr. Chollet, gardener to the Lieut-Governor, elicited warm admiration from both amateurs and connoisseurs, and he was, as he deserved, at the head of the class as a prize winner; every thing he produced has the mark of careful and clean cultivation and taste in their arrangement.

The Charlesbourg farmers and gardeners seem to have come well to the front in the attention they have paid to the cultivation of the excellent soil of the historic parish, for on this occasion they were among the leading exhibitors. Messrs. A. Paradis, A. Bédard, and J. Verret capturing many of the first premiums for fruits and flowers, and Messrs. Bédard, Paradis, Leclerc, and Francis Byrne, twenty-six prizes for vegetables. Mr. Morand, of the Notre-Dame College, Montreal, also had an extensive display, which included some well grown articles.

Mr. Leclerc's collection of vegetables was well arranged and in great varieties, and the collection of potatoes brought by Mr. F. Byrne, also the cabbage, corn, and mangels of Mr. C. Delaney, deserve especial notice.

From the horticultural aspect, the Exhibition was most encouraging to the promoters, and should help to raise the standard of good cultivation to a still higher plane of usefulness.

In these days of close competition, mediocrity is at a discount, and it is only those who produce the most and the best of everything that can hope for success. Herein lies the advantage of these competitive displays.

In the live-stock department, the classes were well filled, and some magnificent animals were brought from different parts of the Dominion; notwithstanding which, the Quebec farmers were well up to the mark, Messrs. Delaney, Ashmead, and others securing many first prizes for dairy and fat cattle, horses, swine and sheep.

The poultry house was well filled and the birds in good feather. The Barred Plymouth Rocks, from Mr. F. H. Bender of Quebec and others, were much admired. Mr. F. C. Barron's Wyandottes carried off most of the prizes in that class. The fine display, and the interest taken in it by the public, show the growing importance that is being attached to this lucrative part of rural economy.

When will the happy day arrive when from

these exhibitions can be eliminated some objectionable features which must have a debasing tendency? A little bit of the prize ring; the Rawdon murder, reproduced in wax work; the foolish aerial bicyclist who risks his life for a few dollars to satisfy the morbid desire for excitement of the thoughtless crowd, etc., etc., would be better away from a gathering in which the beauties of nature and triumphs of art are displayed ostensibly to educate and elevate the moral status of the people.

The Poultry-Yard.

(CONDUCTED BY S. J. ANDRES).

PURE BREEDS ON THE FARM.

The farmer who buys a trio of birds pays more for them, when he is particular about "points." It is true that the points are necessary, as they preserve the breeds, and no farmer should purchase a Plymouth Rock having feathered legs or a rose comb, for such bird would not be pure; but he should not pay five dollars for a bird because the bird has five points on its comb instead of six, provided the bird was true to its breed. What the farmer should do is to insist on having a strong and vigorous bird when he buys one, giving full attention to all the points that ensure purity, and overlook any trivial defects that may appear important in the show room, but which may not injure the bird for breeding purposes. Further, the farmer should not write to the breeder to send him a bird that is wanted for breeding, securing it at a low cost, and then condemn the breeder because the bird is not one that will win in the show room.

S. J. ANDRES.

POULTRY ON SMALL FARMS.

If a small farm of twenty-five acres is set out for an orchard, and a large lot of fowls are kept, the land can thus be made much more serviceable.

It will be necessary, however, to give the hens good care. It will not be crowding the hens to keep fifty on an acre, and of course, one can keep a thousand on a twenty-acre farm. It will not

pay one to keep so many, however, unless you have the necessary experience and ability to do the work properly (for it is work); but even with a less number of hens they are necessary adjuncts to fruit growing, as they render valuable service in an orchard. One advantage in the keeping of fowls and fruits is that the attention given the trees is, during spring, summer and fall, at which seasons the hens can run at large and pick up a large share of their food, while in the winter, when the trees cannot be cultivated, the hens can receive full attention. By this arrangement the cultivator can find profitable employment the entire year, and the hens will give a daily revenue when it is most needed. A flock of hens will thrive only in proportion to the room provided for them.

An acre of ground will afford comfort to a certain number, and while it is not difficult to have the flock larger than is necessary, yet the number of eggs will not be increased. About one hundred hens should be the largest number an acre ought to maintain, and if they are given good care will pay better than two hundred hens, because the larger flock will double the expense in product.

Any farmer who can make a profit of \$50.00 an acre on his farm will do more that can be claimed by many others, but it can be done easily with poultry, while the land occupied by the hens can also give crops and fruit. An acre in grass will give ample forage for one hundred hens in summer, without requiring any food from the barn, and the eggs will cost almost nothing, but when they are crowded, competition results, and the usefulness of the flock is reduced because the conditions then become unfavorable to the best results.

S. J. ANDRES.

THE MOST VALUABLE POULTRY.

The value of thoroughbred poultry to the farmer is equally as great as that of thoroughbred stock of any other kind. It costs no more to keep, brings better prices, and is altogether more profitable stock. A writer says: when he first engaged in farming little heed was paid to the hens. The farm, the garden, the cattle and horses were carefully looked after with a view to profit, but the hens were a side issue.

The flock was mixed and was of no particular

breed, and the eggs and dressed poultry were like the flock, mixed also. There was no uniformity in the product, and the result was that it sold in the markets as ordinary produce. That meant ordinary prices and small profits.

Like all young poultrymen he bought eggs and fowls of many different breeds, and, while he does not regret the experience gained in breeding half a dozen varieties at one time, he soon discovered that a farmer has no time for such expensive fancy poultry farming.

He then selected the breed that he like best and determined to work for profit. The five years he kept stock on the farm satisfied him thoroughly that poultry culture was a very profitable adjunct.

A ledger account showed that the hens paid far better than the dairy cows, both products being sold at good prices. It is commonly supposed that thoroughbred birds are of no account for practical purposes, being bred only for fancy points.

This is true only so far the management of the birds is concerned. A fancier does not care for egg records, but believes in feathers only. He pays the price, and it is a large one, to obtain a desired "point." He pens up his birds, he breeds them "in and in," he conditions them for the exhibition, and the natural result is fine plumage and often delicate and unprofitable birds. His procedure has destroyed a good many fine breeds for profitable purposes.

The choice of one breed means a uniform flock of birds. Such a flock attracts the attention of neighbors and visitors, particularly if well kept. The eggs being from one breed are as a sale uniform in color, which enhances their market value; the broilers and dressed carcasses are uniform in color, and if well fattened bring the best prices. The thoroughbred stamp is on them. Eggs can be sold for hatching purposes to neighbors at an advanced price, much above the price of the common fowl, and the demand for thoroughbred cockerels in the fall is another source of revenue.

The farmer will naturally be puzzled to choose the best breed for his purpose, for, nowadays, every bird has its friends to champion it, and if we are to judge from the accounts we see in the poultry journals or farm papers, there are scarcely any poor ones if we can believe all we read. A farmer must bear in mind what his market

demands and whether it is better for him to sell eggs only or both eggs and flesh; on this depends entirely the choice of breeds.

In the State of New Jersey, many farmers and practical poultrymen select fowls that lay white eggs because the latter bring higher prices in New York City and vicinity. The Leghorn is the favorite, and it is doubtful if there is anything in the whole poultry kingdom, except it be the Minorca white or black, that can excel the Leghorn in their large and valuable egg product. There are other breeds that lay white eggs, such as the Andalusians, Polish, LaFlèche, Houdans, and others, but they do not lay nearly as well as the Leghorns.

The Minorcas and Andalusians lay very fine white eggs and plenty of them, but the edible quality of their meat is not thought so much of in the American markets, because of the black shanks and white skin that belong to these breeds. I am told that the great success of one celebrated firm is largely due to the fact that they keep only one breed and that the White Leghorn, while they do a large business in selling fowls and eggs for fancy purposes, yet the flock they keep turns out a large revenue in the sale of fresh eggs. Another point in favor of the Leghorn is that the surplus cockerels, when killed as broilers and spring chickens, make nice looking carcasses that sell well in the New York markets. White eggs, that are absolutely fresh, will average there over 35 cts per dozen during the year. They retail in New York City at from forty to seventy-five cents a dozen, according to the season and the location of the market. I myself have paid in Montreal and Quebec as high as 50 cents a dozen for eggs and could scarcely get them at that price. There is but very little difference in the laying capacity of the different varieties of Leghorns, but for practical farm use I rather favor the White. There is another advantage in favor of the Leghorn, i. e., the wonderful fertility of Leghorn eggs. They always hatch well, and are particularly well adapted for hatching in the incubator.

Where eggs and flesh are desired, I consider the White Wyandottes and Plymouth Rocks are the best for the all round demand. Both breeds are fine winter layers, and, if the eggs are carefully selected for hatching, all a strain of fowls will result that produce a fine lot of uniformly brown eggs. You can always get as much for brown eggs as white. I always had customers

who were willing to give an advance on the retail market prices for absolutely fresh laid eggs clean and nicely packed in paper boxes. Mr. Doevenstedt in writing in a *American journal*, says: "That the best way to handle these breeds is to sell the eggs from September to March when eggs are high in price. Begin in the month of January to set eggs for early pullets. The latter will commence laying in September in time to supply an active market." He generally continues to set eggs up to May 1st, when he sells off the surplus of old hens, keeping only the finest ones for breeding purposes the next winter. By using eggs from two year old hens for hatching purposes, better stock will result, as a rule. The first lot of chicks will contain many cockerels that can be profitably sold as broilers, but in all later hatched chickens, the cockerels had best be allowed to reach four to six pounds before they are sold, as the demand for such roosters is always good. From November to January 1st, the general market is apt to be flooded with poultry. In regard to handling thoroughbred fowls for laying, they should be kept in pens and yards, not more than 20 to 25 in a pen, in a yard of 10 by 100 ft. More eggs will be gained in this manner than if the fowls are allowed free range. The pens for breeding usually contain ten to twelve hens mated to one cockerel, and, if possible, they should be allowed free range. The laying hens need no male. The hens in the laying pens that are to be kept over for another season should be turned out with pasture after May or June and fed oats or buckwheat once a day. Forcing for eggs throughout the summer from hens that laid during the winter will retard the moulting and too much "dead timber" in the fall and winter will be the result.

Hens allowed to pasture and not forced with grain will moult out nicely.

In raising thoroughbred chickens, whether by natural or artificial means, the great point is to follow closely nature's methods. A hen with her brood on a nice shady grass run will bring up strong chickens. The brooders are artificial mothers, and, except in the early spring months, should be kept out of doors when the chickens can have a range. During January, February, and March chicks do very well when raised indoors, but as soon as the temperature gets over 60 degrees the sooner they get outdoors the better. This especially applies to Leghorns and other

quick feathering breeds. Deprive the latter of a good range, and poor sickly chickens will be the result.

The very best fowl for our farmers is the Plymouth Rock, Barred or White, and the Wyandottes of either variety. Personally, I prefer white colors, because of their making the best carcasses for market, the fine skin showing no dark pin feathers, and the yellow fat making a handsome carcass.

S. J. ANDRES.

The Dairy.

(Correspondence)

Sept. 25th, 1899.

Dear Sir,—You will be pleased to hear that I was fortunate enough to have my butter at the Ottawa Exhibition awarded the "Gold Medal" for best exhibit of creamery butter, we also won other prizes both in Ottawa and Quebec, as well as great success at Sherbrooke. (1)

Faithfully yours,

H. WESTON PARRY.

CREAMERY MANAGEMENT.

The success of a creamery depends mainly on two factors—good location and good management. The best mining engineer cannot make a success if you put him in a desert where he can find no raw material. So the location for raising cows, and forage must be good. I admit that there are certain sections where you can raise forage only with great difficulties and still the creamery is a success. Australia and the North West Territories serve as an example of this; however, as I am speaking generally, we must first look for a pure water supply and food for cows. The farmer needs education in dairying; we know this and we simply have to educate.

The management may be divided into two branches, viz: the technical and the business management. In small and medium sized concerns, i.e., creameries receiving from 10 to 20 thousand pounds of milk daily, I favour having one man at the head of the two, while in large establishments this has to be divided, just as in any industrial factories. Under the head of busi-

ness management is included: 1, selling products; 2, financial management, such as making out checks and keeping in the right shape and place the credits and debits; 3, dealing with patrons, to educate them to keep more and better cows, to teach them the value of by-products, how best to use the same, and so forth.

The technical management includes, first of all: running the factory with the least expense; 2, buying fuel, oil, machinery and supplies.

Before entering on a discussion of these two branches, let me say that the two cannot be separated entirely, but there must be a co-operation between them.

Let us now consider some of the points: We all know the cheapest coal is not the cheapest to use and vice versa. Coal or wood is another question; freight—transportation, another: room for storage, another. Soft coal and green wood make very extravagant fuel bills. I am inclined to think that many creameries would succeed better if they bought the right kind of fuel. Where to buy, when to buy and how to buy should always govern us. Local circumstances, the run and size of the creamery, and especially of the boiler, must be taken into consideration. Keep posted how the market price changes. But now comes the most important point; how to use to the best advantage the bought fuel. It makes a great difference whether the operator uses $1\frac{1}{2}$, 3 or 5 lbs. of coal to one pound of butter. "Firing is an art"—get the most out of the least—should be printed on every boiler-front. A careful, intelligent, thinking buttermaker will save many, many hundreds of dollars of fuel. There is only one way of getting to the bottom of the truth and that is, testing your work with the utmost carefulness.

The oil question is an important consideration. Anybody can buy oil and oil a separator or engine, truly, but not everybody is a good judge of oil and oils intelligently. In oiling as well as firing, we cannot see at a glance our wastefulness: that is, we cannot take the pencil and figure out, how many drops of oil we used for nothing, or how many sticks of wood or shovels of coal we put under the boiler without getting any benefit from them. In buying new apparatus and machinery we must study the following questions:

Have we really use for them?

How much money can we spend for them?

The material they are made of.

(1) Very pleased. Ed.

Where, how and when to get them cheapest?
 The capacity, size or kind.
 Are they easily repaired and kept in order?
 Are they efficient?
 The location and size of creamery.
 How about the future?

A whole lot of other questions enter here, such as, benefit to the farmers; is there any saving connected with their use, and so on?

Now, a careless buttermaker may allow too firm a crust on the boiler-shell. A crust, $\frac{1}{4}$ inch thick means a waste of fuel of 15%, $\frac{1}{2}$ inch, 60%; not to mention that the life of the boiler is shortened by many years. I will not go into details here, but might mention that engines are ruined or costing unnecessary repairs, belts are worn out, separators injured, and a dozen or more unnecessary small expenses caused by either inexperience, carelessness or laziness.

A good technical management includes further: close, careful separating, exhaustive churning, and the manufacturing of products which will always bring the top price and which will command a steady, good market.

In order to trace your work, you must test frequently your skim milk and buttermilk, or what is the best take a composite sample from each separator you run.

Laying out rightly the day's work is only acquired by close thinking and saves many dollars. Suppose a buttermaker wants to test at 2 p.m. and has to have then about 45 lbs. of steam on the boiler. Churning and separating are finished at 11 a.m. Now if he is saving he will manage the firing and not have his boiler b'owing off from 11 to 2 p.m. every ten minutes. Or for another instance: After the day's work is done, he has to fire up again in order to fill the water tank, which he ought to have done while he was running.

The care of supplies and paying attention to small items should not be overlooked. Perhaps nothing better than a demonstration will show too, how much a wastefulness in small items only amount to:

One broom, 25c.; one brush, 25c.; three boxes of lye, 15c.; two cakes of soap, 10c.; oil wasted, 35c.; total, \$1.10; say for a month, or in a year, \$13.20; add to this amount careless skimming and firing and you may get \$50 or \$60, not to speak of a shipment of too high colored butter or mottled butter, or by impatience at the weigh-can,

thereby causing a patron to deliver his milk to another factory.

In ordering goods, think over first what you need and then write out the order, so that you won't have to pay two freight bills when one would have sufficed.

I said in the beginning that the business management includes selling products.

This may seem easy, but selling products to the best advantage wants business capacity, whilst holding good customers requires technical perfection. Local circumstances play a most important part here; also other points, as transportation rates, condition of milk, equipment of factory are to be taken into consideration.

Don't pay commission to have your product sold for you, but let the business manager attend to this himself. What do his duties amount to if through laziness or for other reasons he shelves this responsibility; but rather swell the returns to the patrons not to the commission agent.

Working up a large run of milk means decreasing the running expenses, whilst delivering only good milk means A 1 products.

To have satisfaction amongst the patrons is a hard task. Test, milk and check are bringing "lots of kicks" and the buttermaker and manager must work here in co-operation.

There are other matters which indirectly influence the welfare of the creamery, viz: good roads—sometimes their influence is felt directly—municipal, county, and Provincial laws. Keep a-breast of the time; be wide awake and take a broad view of your business.

How can we get buttermakers, who are technically well prepared and have enough business knowledge, to manage on an economical basis a creamery? First, engage only good men; second, pay them good wages, and third, have them financially interested in the creamery. I would say much more here, but this will be enough at present.

Let us now summarize the main points, as I am afraid I shall tire out my readers:

1. Buy that fuel which gives the most heat at the least expense.
2. Be a thinking and saving fireman.
3. Take the best care of boiler, engine, pumps, separators, belts, churn, supplies, etc.
4. Keep everything inside and outside of the creamery clean and in good shape.

5. Handle glassware with care and be economical with oil, ice and so forth.

6. Churn and separate intelligently and strive to make the best products.

7. Buy only what is necessary and use your best judgment in buying, always remember what, where, when and how to buy.

8. Increase the run of your factory, educate your patrons and be a diplomate in dealing with them.

9. Sell your products yourself, in the best markets with the least expenses.

10. Look after small items.

11. Try to overcome difficulties, be honest, not afraid to work, think and plan carefully and wisely, have patience and endurance.

12. Conduct all business on a sound basis, keep your credit and debit side in harmony, don't overlook the future, take a broad view of your business, investigate, go to the bottom of the truth and success will follow your footsteps.

H. WESTON PARRY.

Compton, Sept. 25th, 1899.

CHEDDAR CHEESE AND HOW TO MAKE IT.

He would be a bold man, who would dare say that any one of the many methods of cheese-making was the best, or even venture to select two or three as preferable to others. That such cannot be said at present, is proved beyond dispute by the fact that the great prize winners in England for Cheddar cheese have in the past frequently followed a method peculiarly their own, and one differing in some particulars from the methods of other makers.

At the same time it is to be doubted, whether it can be said that those who practise any one system have been more successful than those practising some other system. Hence it is better when asked "What system of cheese making do you recommend one to study?" to answer "The system about which you already know most, and have been accustomed to practise." There exists no standard system of making Cheddar cheese, and even after devoting years to the study of cheese making, with the view ultimately, if possible, constructing a standard system, at present the task cannot be attempted. So it is better to stand by the above principle, and for the present

recommend cheese-makers to study more carefully the system they already adopt and have had experience with.

Success will then depend upon two considerations: First, that makers must start fair: and second, that they must know their destination. Now as regards "starting fair." The cheese maker commences work in the dairy, on milk which has been brought there by others. Unless that milk is suitable for making cheese—and experience teaches that this very often is not the case—no amount of skill will enable an excellent article to be produced.

Milk for cheese making should be of good quality, but it *must* be clean. A good cheese may be made out of milk which is not of good quality, in other words, which is not rich in fat, but a good cheese can *never* be made from milk which is not clean. This word "clean" is so generally used to designate the absence of visible dirt, that we really need a new word to designate invisible dirt, for it is this latter which plays such havoc in the dairy. The visible dirt can, and should be removed from the milk in every cheese dairy by putting it through two thicknesses of the finest straining cloth. By carefully examining what is on this cloth, the cheese maker may obtain some notion of the source of the visible dirt, which has entered the milk.

Indeed, where the cows are milked at any distance from the dairy, it is well to strain the milk of each cow at once. Something is then done to keep out the visible dirt.

But the invisible dirt. How can this be kept out of this milk? Let us first ask whence it comes. Primarily from the atmosphere. The milk as it passes from the cow's teat into the pail, washes the atmosphere and takes up from it invisible living matter, which grows luxuriantly in the warm milk. What will not flourish and thrive on milk? Now is this surrounding atmosphere pure, or as pure at least as any reasonable care on the part of the farmer can make it? It will not be pure if the cows are milked in a dirty stall, or even in the field in the same place, where they have been milked day after day for weeks, where their droppings have dried up, and are scattered in the air by every movement of the animals. It will not be pure if they are milked when men are carting manure, or hay or any dry material, provided the wind is blowing from that direction. Even the direction of the wind may

greatly effect the purity of the atmosphere. And it is in knowing these things, and guarding against them, that success often depends, while the absence of this knowledge means constant heart-breaking failure. Still, another very simple cause—the milker rubs himself against the side of the cow, or the animal switches her tail, and if there is dry dirt on either it is dislodged and contaminates the atmosphere and enters the milk in the pail. Keep the cows clean then! Prevent them from standing in dirty streams, streams often polluted with sewage, which subsequently dries on the coat and, finding its way into the milk, spoils the cheese. One more fruitful source of failure is want of cleanliness in milking. Sometimes the teats of the animal, sometimes the hands of the milker are at fault. Both should be washed before milking commences.

It may appear to many, and even to those most interested that too much stress has been laid upon this subject. Have these ever tried to discover the reason why the cheeses of the present days are, if we are to believe universal opinion, inferior to those made in days gone by? Thoughtful and earnest men have devoted much time to elucidating this, and have come to the conclusion that it is not so much due to want of skill in making the cheese, as to want of cleanliness in the milk. Hence in the opinion of these experts, more cheese is spoilt before even the milk enters the factory than is spoiled by want of skill on the part of the maker.

Nevertheless, many makers have yet much to learn concerning the art of cheese-making. What, then is the knowledge that is needed?

When once the curd is ground, placed in the vat and in the press, the manufacture proper is at an end. In a few days the unripe cheese is taken to the ripening room, and time and temperature will do the rest of the work. The cheese will ripen into a good or a bad cheese, according to preceding conditions, and no skill on the part of the maker can subsequently affect the result. You may raise or lower the temperature, you may keep the cheese a long time or a short time, but you cannot make a bad curd into a good cheese during the process of ripening.

So we may accept it as an anxious that the fate of a cheese is foredoomed when the curd is put in the vat.

Now, provided the milk from which the cheese is made be pure, the cheese itself, its quality that

is, will depend upon two things, part of course from the richness of the milk. Naturally a rich milk makes a better cheese than a poor milk. What then are the two all important considerations? The first, and by far the most important, is to obtain in the curd, before it is vatted the proper amount of acidity. If this is secured, the cheese cannot fail to be good, and if the same amount of acidity is obtained in the curd day after day, the cheese will be uniform also.

The second condition requisite is to obtain the same amount of moisture in the curd day after day.

If the curd is too wet it will have a tendency to "heave" if too dry it will not cut mellow. (1) But as a rule of care is taken to obtain the proper amount of acidity, the curd will probably contain, neither too much, nor yet too little moisture, as as the former fault is generally due to a want of acidity and the latter to too much acidity being present.

But, the cheese-maker may say, how am I to know when this acidity, which seems to play such an important part, is obtained? Undoubtedly that is the great difficulty in cheese making, to know what acidity is present.

As in years gone by, cheese makers depended on the sense of feeling to judge temperature, so now they depend to a large extent, on feeling, taste, and smell to judge acidity. But just as the thermometer has superseded the hand, so in the future must an accurate test of acidity supersede the rule of thumb practically in vogue. One must be extraordinarily gifted to judge accurately the temperature by the sense of feeling, and then only is it possible after years of experience. How much more difficult it is to judge of acidity very few realise, and the inability to do this is the chief cause of failure among Cheddar cheese makers. It must not be supposed that such a broad statement as this, is made on theoretical grounds. The fact has been slowly forced upon us as the result of long observation. Only see the trouble men have taken to discover a simple test for acidity, as yet without any positive success. The hot iron test is only an approach to accuracy, and those who have tried it most thoroughly best know its imperfection. At present there is a

(1) Our Gloucestershire tenants persist that if the pastures of the Vale of Severn are dunged, the cheese will "heave." *Ed.*

growing demand for Lloyd's acidity test, doubtless this apparatus is the best on the market.

With an accurate thermometer, an accurate measure for the rennet, and an acidity apparatus, the manufacture of the Cheddar cheese may be reduced to a scientific art, instead of remaining an industry based on rule of thumb.

Now a few words as to the processes necessary for the making of the cheese.

At the commencement I stated that any system, properly carried out, would secure or ensure the manufacturer of a good cheese. Properly carried out! By that I mean that the cheese maker must clearly know the object of each part of the process adopted.

It is impossible to lay down any fixed method of cheese-making, or even any principles concerning details which could be universally adopted. Let us take therefore three methods, each much in vogue. Those who adopt No 1, ripen the milk with great care, that is to say they obtain in the milk a definite amount of acidity, before they commence the days work. The acidity is often estimated by finding out how many seconds it takes for a given quantity of rennet to curdle a given quantity of milk at a certain temperature. Suppose the milk is not quite ripe enough. Then the bulk is kept warm, for say half an hour, and again tested, and not until the required ripeness or acidity has been obtained is the rennet added.

Those who adopt method No 2 proceed on a different system. In order to get the evening's milk ripe, care is taken to keep it warm, so that in the morning it shall be at a certain temperature. Then the morning's milk is added and cheese-making begins. Even if the evening's milk has fallen below the requisite temperature, the rennet is added as usual, and no test is made as to ripeness, the requisite acidity being obtained at a later stage of the process.

Workers by method No 3 take a certain amount of care to keep the evening's milk warm, but not much: there is no definite temperature at which it should be in the morning, no special test for acidity is used, but to secure this a certain amount of whey, kept over from the day before, is added to the mixed milk before it is renneted.

Hence there are three systems as completely different as they can be, and in every subsequent stage of each they differ as much as they do in the start.

Yet in its turn each has produced a cheese, second to none of the year, and each is capable of producing at any time excellent cheese. Examine them more closely, and in no respect do they seem similar. The quantity of rennet used for a given quantity of milk is not the same in either method, the temperature of the scalds are not the same, nor yet the treatment of the curd. How, then, can they each result in the production of an excellent cheese? Because if we examine the curd when it is put in the vat, we find that by each system, it contains about 40 per cent of moisture and 1 per cent of lactic acid. How true then is the saying, "all roads lead to success," if only we know what we want to arrive at.

The amount of acidity in the curd can be determined by estimating the acidity in the liquid which first comes from the press. Let then each cheese maker who desires to succeed determine what that acidity should be, and then learn how to secure it every day regularly.

A little trouble and a little skill only are needed not only to learn how to use the acidity test, but even how to obtain daily the desired acidity in the curd.

Roughly we may say that if the liquid from the press shows 1 per cent of acid, the curd is acid enough, and not too acid. If more acid is present the cheese will ripen more rapidly, and may turn out too acid when cut. I say "may" because there are conditions, when it will not always do so, but to enter into minute details is beyond the scope of this article.

If the liquid from the press contains less than 1 percent of lactic acid, the cheese will ripen more slowly. There is another factor which also seems to affect the ripening of cheese, though in what way it has never yet been clearly shown. It seems generally recognized that the more rennet used, the more rapidly will the curd ripen, and the more rapidly get rotten. Hence it is well to use no more rennet than suffices to bring the curd in a proper time.

If, as so many cheese makers do, you sell the whole of one month's make at a time, have two ripening rooms, one at about 60 degrees Fahr., and the other at 65 or slightly higher, and you find you have developed too much acidity in the curd, ripen the cheese at the lower temperature. This to a certain extent may slightly counteract the influence of the acidity and tend to make the cheeses more uniform.

Skill and care, careful observation, and a record of facts, with proper apparatus for discovering those facts will result in uniform and good cheese being made, be the method adopted what it may. Only one thing now is needed: cleanliness—cleanliness in the apparatus, and in the milk, for without this, success is not to be obtained by any one of the best methods of manufacturing Cheddar cheese.

W. R. GILBERT.

COMPETITION OF MILCH-COWS.

Register kept by the Farmer's Club of ST-MICHEL DE ROUGEMONT, in the County of Rouville.

Date of the competition.	NAME OF THE EXHIBITOR.	POST-OFFICE ADDRESS.	Name of the cow.	Age.	Breed.	Color.	Date of calving.	Weight	Name and breed of sire.	Name and breed of dam	Yield in milk.		Total.	Butter-fat.	Order of Merit.
											Morning.	Evening.			
1899							1899				lbs.	lbs.	lbs.	%	
June	Anthime Arès	Rougemont	Janne de Rougemont	7	Jersey Canadian	Yellow	April 19	900	George	Anne de Rougemont	27½	25½	53	3.7	1
	Joseph Fontaine	do	Isabella	9	Ayrshire	Caille	do 15	1100	William	Duchesse	20½	21½	42½	4.	2
	Richard Fontaine	do	Dora	10	Cross	do	do 3	1100	Ayrshire	Durham	21½	21½	43	3.9	3
	Arthur Fontaine	do	Brillante	10	Ayrshire	do	do 15	1150	do	Ayrshire	16	25	41	4.1	4
	Uldéric Meunier	do	Mattée	12	Canadian	Brown	May 19	700	Canadian	Canadian	18½	20	38½	4.4	5
	Hormidas Robert	do	Jeunette	6	Cross	Wavy	do 15	850	Durham	Ayrshire	13	21½	39½	4.1	6
	Didace Lapalme	do	Fleurie	7	do	Caille	March 25	800	Ayrshire	Durham	17	19½	35½	4.7	7
	Damase Métivier	do	Louise	7	Canadian	Brown	April 15	850	Jumbo	Canadian	18	15	33	4.4	8
	Pierre Paquette	do	Brunette	6	do	do	do 17	750	Canadian	do	10½	21½	41	3.1	9
	Pierre Mailloux	do	Caillette	8	Cross	Caille	do 10	900	Durham	Ayrshire	11½	17½	39½	3.	10
	Isaïe Charon	do	Rougette	8	do	Red	do 20	800	Ayrshire	Durham	15	17½	32½	3.9	11
	Aldège Sicard	do	La Melasse	6	Ayrshire	Caille	do 2	850	Margo	Charlotte	14½	17½	32½	3.6	12
	L. H. Bachelder	do	Daisy	8	Cross	do	March 1	900	Ayrshire	Durham	15½	15½	31½	3.5	13
	Téles. Forand	do	Lajenne	6	do	Wavy	April 20	700	Unknown	Unknown	16	14	30	3.2	14

Milk tested by M. Aubin, district-inspector.
(Signed)

A. DAMF, Sec. Treas. O. A. St-M.

Signature of the Judges

CHARLES MEUNIER,
L. M. BOULET,
NAPOLEON ARÈS.