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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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Notes by the Way.

Bulletins. — All our readers are earnestly advised to send their addresses to Mr. Saunders, the Director of the Experiment-Farm, Ottawa, with a request that the bulletins issued there may be forwarded to them. Letters need not be free-paid, and no charge of any kind will be incurred. We hope that, in future, more advantage will be taken of the opportunity thus offered by the government of obtaining full information concerning the various experiments that are being carried on at the several farms established under the management of some of the most skilful agriculturist and expert chemists of the Dominion.

Barnyard-manure. — We have just received, from Prof. Shutt, of the Experiment-Farm, Ottawa, a treatise on the care, application, etc., of barnyard-dung, a full analysis of which we hope to publish in our next number.

Notice to Contributors.—Our contributors are requested to send in their accounts for payment *quarterly*, as the constant recurrence of small claims gives a great deal of trouble to the accountants of the Department.

Basic slag.—As there seems to be a good deal of doubt as to the cost of the phosphatic manure called "Thomas's," we applied to Mr. Gigault, the assistant commissioner of Agriculture, asking him to have the goodness to give as a statement of the cost of some that he imported from Liverpool last year. The following is his reply :

QUEBEC, Jan. 12th., 1899.

Dear Sir,

My basic slag, at my farm, cost fourteen dollars. That was the first lot I imported, last spring. According to the analysis, made by Alfred Lintham (it is hard for me to understand his signature) of Liverpool, official analyst to the Liverpool corn trade, the per centage of phosphoric acid was 21.14.

Yours truly,

(Signed) G. A. GIGAULT.

Now, as the price quoted in the *English Agricultural Gazette* for basic slag of the finest quality containing from 38 to 45% of phosphate is \$8.64 a ton, (Mr. Gigault's importation analysed 46% of phosphate) it follows that the f. and i., with landing and other expenses, came to \$5.00 a ton, of we presume 2,240 lbs.

Although this manure does not seem to answer on all sorts of soils, we think that experiments on an extended scale should be tried, under the auspices of every farmer's club in the province.

Bacon-hogs.—What is a bacon-hog? What is the breed of swine likely to turn out hogs suited to the requirements of the large manufacturers of bacon for export? What food is most likely to be converted into sound, firm bacon by the latter? These are some of the questions connected with the pork-trade in Canada that need solution.

Mr. Andrew Dawes, of Lachine, tells us that the Tamworths may make good firm, lean bacon for the English market, but that, after giving them a fair trial, he found it did not pay to fatten them.

Another pig-breeder, from the States, swears by the Poland-China; a third, by Yorkshire; a fourth says there is nothing like the Berkshire, and a fifth holds by the Chester-whites.

Well; which of them really deserves our preference? Who can tell? Is it not more a question of training, so to speak, than of breed? If pigs are fattened from their early days, up to the time of slaughtering, they will probably turn out over fat and too soft for bacon, though they may make good pickled pork. It is clear, however, that until the animal is exploited, it will always be difficult to judge of its suitability to the bacon-curer. Look at the reports of the "Block-test" of the Ontario Provincial Fat-Stock Exhibition.

The sweepstakes prize for the best live bacon-hogs was won by a nice pen of pure-bred York-

shires; but when it came to the block-test, these pigs were only awarded the fifth place! The first prize in the block-test was won by a pair of Tamworths; but one of them was 11½ months old, while one of the Yorkshires was 5 months younger and only weighed, when dressed, 8 lbs. less! Which paid the better is easily seen.

It was observed, at the conference that followed the test, that the packers received by far the largest proportion of cross-bred hogs. Many of the farmers present thought that a cross between the Yorkshire and the Berkshire paid better than any other hog, that is, for bacon. Mr. Leach, a partner in the Wm. Davies & Co.'s firm, preferred the Berkshire and Yorkshire cross to any hog, as the former gives the best ham, and the Yorkshire the length of body and the thickness of belly.

As to the feeding of the hog for bacon, good sound food and plenty of exercise on clover or pasture, with a month before slaughtering on barley meal first and then on pease, we believe to be still, as it used to be when we were in the habit of fattening from 100 to 120 pigs a year for the London market, the best treatment. As to cooking food for hogs, Professor Curtiss only repeated a very well known piece of advice, when he stated that potatoes were the only food for hogs that paid for cooking, a doctrine that was promulgated by Professor Johnston in his lectures on Agricultural Chemistry, published in or about 1846.

The following paragraph, from the *North-West Farmer*, gives the general opinion of the meeting. Can roots make firm bacon? We should doubt it.

The first prize pigs were pastured during the summer and had a little mill feed given them. When the cold weather came on they were penned and given roots and grain. Roots were strongly recommended for growing hogs, especially if the pen was not too cold. Pasture of some kind, with a little mill feed or grain, is the ideal way to feed bacon hogs in the summer, and warm quarters, with roots and grain, the ideal winter method. One of the packers recommended cooking roots for the hogs, but Professor Curtiss, of Iowa, who was present, said that the result of numerous experiments in the United States showed that potatoes were the only feed that could be profitably boiled.

Dairy-Shorthorns.—We see, by our exchanges,

that the Hon. John Dryden, the Minister of Agriculture for Ontario, is about to import a herd of "Milking Shorthorns" from Scotland, for the use of the Ontario Agricultural College. These, we presume, are pedigreed stock, but we must say we should prefer going to Darlington fair, in the county of Durham, and picking up a lot of the fine Dairy-Shorthorns to be found there at most seasons of the year, and putting them to a thoroughbred Shorthorn bull of one of the milking strains. The tenants on our family's estate in Glo'stershire, some of whom milk upwards of a hundred cows, have followed this plan for more than thirty years, and have done well by it.

The root-crop.—We gave, the other day, a report of some of the roots exhibited at the Glo'ster show. We have since that time received an account of the yields of root-crops entered for competition for prizes offered by Messrs. Webb & Co., the seed growers of Stourbridge, England. It must always be borne in mind that in England we cannot sow swedes or turnips much before the 10th of June; for if sown earlier than that date, they are almost sure to mildew, in which case, not only is their growth arrested, but the quality of the root is seriously lowered, the flesh, so to speak, becoming what the French-Canadians very properly call *cordée*, or stringy. On the other hand, mangels can hardly be sown too early; though the books talk of their running to seed if sown before the middle of May, we never saw such a thing happen where the land was well manured and prepared, and the seed selected from a good stock. If the plants should happen to run to seed, that seed should never be used, as there is no doubt of its following the bad example set by its progenitors.

The following weights are given in tons of 2,000 lbs.:

Ayrshire gave the best crop of swedes: 46 tons, 1,744 lbs.; Cheshire produced the next best, 44 tons, 1,040 lbs. Both of which crops we have seen equalled, if not exceeded, on M. Séraphin Guèvremont's farm at Sorel, though in mangels, a Welsh farm, near Cardiff, Glamorganshire, with its enormous yield of 84 tons, 1,456 lbs., beat anything Sorel can do by two to one; but that was not the best showing the mangel crop could make, for at the Lucan (Ireland) dairy-farm, 103 tons were grown. At Birmingham, Professor Long said that he had measured six swedes shown there, all of

good form, 37 inches in circumference; they weighed on an average, 20 lbs. a piece!

It is very curious why mangels at Sorel do not yield nearly as well as swedes or Belgian carrots; for mangels like hot summers and swedes certainly do not. In the South-Eastern counties of England, we looked for at least 25 gross tons of mangels from an acre, but were pretty well satisfied if we got 15 tons of swedes, and they not of the best quality.

Potatoes.—Manitoba is crowing pretty lustily in the *North-West Farmer* on the superiority of its potato-crops as compared with those of the "effete East"! Professor Zavitz, the experimentalist at the Guelph College, cannot, it appears, get more than from 124 bushels an acre for early potatoes, and 191 bushels for late sorts; while Manitoba shows an average all round, not of your grand college-crops, but of the general farming districts, of 205 of the best and 144 of the inferior lots! As for the exact and authenticated reports from the Manitoba experiment-stations, we have Brandon reporting ten varieties ranging from 682 bushels down to 579, and Indian Head, with 100 varieties, only one of which gave as few as 300 bushels, while 706 bushels was the yield of the best. True enough, doubtless, but did not our friend Mr. Wm. Hale, of Sherbrooke, grow something worthy of "the effete East," when, in 1891, he turned out 726 bushels of Scotch Champions from an imperial acre of Eastern Townships ordinary farm land? (v. *Journal of Agriculture*, June 1892, p. 89).

By the bye, it would be as well to mention that this enormous crop was grown from "sets cut to two or more eyes; and the drills being made 30 inches apart and the sets dropped 12 inches apart in the drills, it took 20 bushels to plant the acre." We stated, in the last number of the *JOURNAL*, that our English practice was to use 22 bushels of sets to the acre, so our practice agrees pretty well with Mr. Hale's, as our drills were three inches nearer together than his. Mr. Hale, it will be remembered, won the prize offered by a "chemical fertiliser company for the largest crop of any kind of marketable potato on any acre, either in the province of Quebec or Ontario, with a yield of 438½ bushels."

Now, such crops being possible, how is it that the average yield of potatoes in the States and Canada can be, as Mr. Hale says it is (see the

same page of the Journal), only 80 bushels an acre? How very small some of the yields must be to pull the average down so low; for there are some fair, even some good crops grown here.

According to our English computation, Mr. Hale's crops would weigh 487 bushels, and all but 780 bushels; the English bushel being 56 lbs., and the Canadian, 60 lbs.

Pretty fair yields anywhere!

The end of the "Dairy-Cow."—We like to see people carry their ideas out thoroughly. A writer in *Hoard's Dairyman* pleases us immensely; there is no mistaking what he means.

"A very puzzling question occurs to the dairy man as to what disposition to make of his cows when old age, disease or accident has incapacitated them for any further practical use in life. To be sure, a diseased cow must be killed and buried; but the cow in health, but passed beyond the stage of profit to her owner, what shall we do with her? Beef is out of the question. We might as well think of fattening a match, as the saying goes, as to try to fatten a cow of true dairy type.

There are men who put up canned beef or make the Bologna sausages, who will perhaps give a paltry, inconsiderable sum for her, at most but a very few dollars. But after all it is rather revolting, I say, to think of a pet dairy cow, an animal that for many years has returned steady annual profits to her owner; it is revolting, to think of this animal in time of weakness and decrepitude, turned over to be ground up into sausage. No, she has earned a well merited repose. Let her die a peaceful death, and let her bones lie undisturbed within the kindly embrace of mother earth, where, as she slowly disorganizes, her molding tissue will restore fertility to the soil that has so long afforded her nourishment.

I pity the condition of the old horse, who has served his master long and faithfully for many years, only to be sold to a rag dealer, junkman or fish dealer in his old age and time of greatest need. This is the way his honest toil has been rewarded. He has been cast aside with as little thought or consideration as the remains of an orange are thrown into the gutter after its juices have been sucked nearly dry. Lamentable, yes, scandalous is the practice of turning the poor, weak, lean, helpless beast over to a brutal driver, for a mere bagatelle of a consideration. Likewise, mercenary is the practise of delivering up to the

tanner the deerlike body of the Jersey or Guernsey. The typical dairy cow has paid her owner handsomely for many years. Give her *Christian* interment. It would not be out of place either to raise a stone or monument to her, who has closed and finished most creditably a long and useful career.

M. SUMNER PERKINS."

Mass.

And yet the same person has a glimmering of common sense now and then; he has sound ideas about feeding:

"It is not good feeding economy to give dairy cows timothy hay. Corn fodder is worth as much to feed as is timothy, but the fodder has not one quarter of the market value of the timothy. The truth is, timothy has a very fictitious market value, brought about by the fancy of horse owners for it. So the duty of every dairyman, who has good timothy, is to sell the same to the horsemen and buy good rowen and clover hay with the proceeds. The latter hays are ideal cow feeds.

But fancy monuments erected to the memory of a cow! It reminds us of the Canine Cemetery on the banks of the Thames established by the late Duchess of York for the internment of her pet dogs. There were some forty or fifty tombstones there, but the Duchess had not had many of the interred dogs long. The fact is, the Duchess being known as a great lover of dogs, people were always sending her some choice specimen or another as a present. When the kennels became over-populated, the last comers were submitted to a humane euthanasia and buried in the aforesaid cemetery.

Canadian poultry.—Recent shipments of poultry from this country seem to have done well; some of the lots sold in Liverpool for 16 cents a pound wholesale, which as they weighed 5½ lbs. each, makes them worth \$1.76 a pair. The shipment was made from the Dominion Government Poultry Fattening Station, at Carleton Place, Ont. The birds were plucked but not drawn, and were landed in first class condition. The following extracts from a letter from the consignee will indicate what the prospects are for a further development of this trade:—"I was agreeably surprised at the all-round excellence of your small experimental shipment of Canadian capons. On opening the cases the birds were found to be in beautiful condition, and presented a most saleable

appearance. After the birds were uncased I hung one, to find how long it would retain its bright appearance, and found that it became milky white in color as soon as the bird had dried out of the chilled state. To-day, five days later, it is as nice-looking as a fresh-killed bird. I think the price obtained will both please and pay you. It is a fair market price, and on a par with the present rates for Surrey chickens. For small weekly arrivals I venture to think the price could be maintained, but anticipate that large consignments would bring the figure down to seven pence (14 cents) per pound."

There was a howl the other day, in one of the U. S. agricultural papers, against "the cruel practice of castrating fowls." By all means let all emasculating of male animals, such as ram-lambs, boar-pigs, bull-calves, and colts be given up too, and a nice men we shall soon find ourselves in! We believe that in some of the States the spaying of heifer-calves and sow-pigs has been made illegal! Can anything be more ridiculous than such pseudo-sensibility.

Profit in feeding lambs.—We extract the following from *Farming*:

"About thirty of the lambs were well-bred Cotswolds and ten were Shropshire grades. My experience tells me that the Cotswolds are far ahead for winter feeding. After weaning, the lambs had a small patch of rape. When this was done they were turned on clover till the snow came, when they were taken under shelter and fed lightly for a couple of weeks. On December 8th they were weighed, averaging 105 lbs. each.

The lambs were then fed for eighty-five days on the following: clover hay, 1¼ lbs. per lamb per day or 106 lbs. for the period. This at \$5 per ton would be 26½ cents for each lamb; grain, ground, 1½ lbs. per day per lamb or 127½ lbs. for the period, worth at 80 cents per cwt. \$1.02. Turnips 10 lbs. per day per lamb or 850 lbs. for period, worth at 6 cents. per lb. 85 cents per lamb.

From this I deduce the following:

Cost of feeding one lamb eighty-five days.

106 lbs. of hay at \$5 per ton	\$.26½
127½ lbs. of grain at 80 cents per cwt.	1.02
850 lbs. of turnips at 6 cents per bus.85
Total cost,	\$2.13½

Adding to this the cost of each lamb \$2.50, we find the total cost to be \$4.63½.

At the end of the fattening period the lambs weighed 134½ each and the price I received was 5 cents per lb. or \$6.72½ each and, therefore, the profit per lamb was \$2.09 and on the 40 lambs \$83.60. From this the price of pasture for probably two months should be deducted.

I find it profitable to cut the hay. In feeding in racks the lambs pick off the leaves and heads and waste a great deal of the best feed, but when it is cut they eat it up clean.

I find that sheep are the most profitable part of farming, and if in answering your letter I have been of any service to you I shall be very much pleased indeed.

WM. RICHARDSON.

Vandorf, Ont., Dec. 23rd, 1898.

Sheep-dung.—Professor Roberts, of Cornell University, says that the manure of a sheep is worth \$3.17 a year. Well, that depends upon circumstances. If the sheep are kept *on the land*, and not allowed to lie about in the ditches, in the roads, on banks, and in the bush, we have no doubt that Mr. Roberts' calculation will come out all right. But just look for a moment at the facts. The truth is, the dung and urine of the sheep is, as a rule, more than half wasted. No; fold your sheep, in summer, on your green-crops, and, in winter, keep them under shelter on well bedded layers, and you will find the English saying come true, that "the sheep's foot produces gold." An acre of fallow land folded over by sheep, used to be valued in England to an incoming tenant at £3.10. The sheep ran on the pastures—*down-land*—winter-oats, etc., all day, and were folded on the fallows, in preparation for wheat, from 6 p.m., till the dew was off in the morning. This went on till the wethers were 2½ years old, when they were sold to the farmers of the lowlands to be fattened. Thus, none of the manure, liquid or solid was wasted.

Experiments in Iowa and Pennsylvania seem to show that crude petroleum or oil can be used as a valuable adjunct for roadmaking. After the dirt road has been prepared and smoothed in the ordinary manner it is claimed that the application to the surface at the rate of one barrel to 100 feet of road twelve feet wide, will cause the surface when dried to become hard and impervious to rain.

The present cost of oil at the wells in the United States is 90 cents per barrel. At that rate the oil for a mile of road would cost about \$47.50, not including freight. If the plan proves successful it will be the cheapest yet found for meeting the crying need of the country for good roads.—*Farming.*

The grade of eggs required for the British market is one that will weigh a pound and a half to the dozen, and for every half-pound which eggs weigh less than fifteen pounds to each ten dozen, the value is lessened by about one cent per dozen. It is believed by those engaged in the import trade that in large eggs the albumen is thicker than in small ones, and that ninety per cent. of the stale or bad eggs are small eggs with white shells. Shells of a brown color are preferred, and must be clean without having been cleaned.—*Farming.*

The Horse.

RAISING THE COLT

By Alex. Galbraith, Secretary American Clydesdale Association.

The old adage that an article properly bought is as good as half sold may by a slight alteration or paraphrase be made to read that a colt properly bred is half raised or at any rate more easily raised on that account. That "blood will tell" has been so conclusively proved to every man of experience or observation as to leave no room for dispute at this time of day. Farmers should see, therefore, that their colts are bred only from worthy ancestors and that they do not inherit any serious blemishes, weaknesses or malformations which will naturally mar the colt's usefulness nor lessen or destroy its value.

Before speaking of the colt, however, I would say a few words regarding the treatment of the mare during pregnancy. Experience proves that the more natural and less artificial the conditions the better. Fat and idleness are to be deprecated especially. There is no breeder of any extent but who will confirm the statement that better results will almost invariably be obtained by keeping the mares in medium flesh and working constantly, but not of course excessively, up till time of foaling. If work cannot be provided for all the

brood mares they should at any rate have abundant exercise daily and on no account be confined to the barn closely. Corn should not be fed at that time. It is too fattening in its tendency and does not contain sufficient nitrogen and ash to build up the frame of the unborn foal. Let oats and bran be the staple ration with a few roots daily—carrots preferably. As the time for foaling approaches see that the mare's bowels and digestive organs are in good, healthy condition and if necessary increase the proportion of bran, giving it in the form of a mash every evening. Clean out carefully a good roomy box stall, have it thoroughly bedded with clean straw and turn the mare into the stall every evening. See that it is scrupulously clean, however, as the chief danger to colts comes from septicæmia or blood poisoning, by the absorption of filth of disease germs through the navel cord at time of birth.

There has frequently been a great mortality among foals throughout the country from that cause. The symptoms are a swelling of the young colt's joints, first one, then another, a loss of appetite and vitality, resulting usually in death from one to two weeks from time of birth. In addition to absolute cleanliness in the stall and on the part of the attendant, an excellent preventive is an application of carbolic acid—say ten per cent. strength—to the navel cord at time of birth and twice daily thereafter for about four days. Some other preparations are excellent, notably one called Umbilicure, which can be had from Prof. A. S. Alexander, Evanston, Illinois, by the use of which all danger from blood-poisoning can easily be obviated.

Now, assuming that the foal is safely born and has learned to suck—which is the first operation—it is well to see that the youngster is neither suffering from constipation nor diarrhœa, either of which, if allowed to continue many days, will prove fatal. A tablespoonful of castor oil and an injection of soap and tepid water may be administered with good results during the first few days of the colt's life in case the bowels are in any way unnatural; indeed, many successful breeders make an invariable practice of giving a small dose of castor oil as a lubricant to every young foal. The practice is a safe one, and frequently very efficacious. Weather permitting, the mare and foal may be allowed to run out during the day as soon as the colt is a day or two old, good judgment, of course, being used in not allowing them to stand long in

the cold nor in a drafty place, and on no account must the foal be allowed out when raining, as the soft, woolly texture of his coat readily absorbs moisture, which results frequently in colds, rheumatism, or bowel complications.

The young colt should be taught to eat oats just as early as possible—some will commence to nibble along with their mother when only a few weeks old. Later on they should, when the mare is being fed, and I recommend all brood mares to get a feed of oats at least once a day, receive a small allowance of oats where the mother can't reach it. The habit once learned, the youngster will come regularly and readily for his grain ration—the result being that when weaning time arrives, at four or five months old, he is practically independent of his mother's milk.

The colt should be handled kindly and regularly and halter-broke just as early as possible. When weaned, it is desirable that the colt be not left alone but put in the company of another colt, or, failing that, some other quiet, good-tempered animal. Horses are social beings, and do best when not in solitude. From weaning time onwards it is most essential that the colt receive a liberal and nutritious grain ration with great regularity. This is the point where the average farmer falls short. He is apt to consider that, as the colt is young and small, he should be fed sparingly and will become a better horse if brought up "hardy" and allowed to rustle for a living round the straw stack. Such treatment is cruel and suicidal. The young colt will certainly become stunted in growth and never can mature into as large, as good, or as valuable an animal unless he gets a sufficient grain ration the first winter especially.

As to the amount of grain which can be safely and judiciously fed, this necessarily depends on the individual case. The quantity which the colt is able to "clean up" will soon be ascertained, and, with plenty of out-door exercise—and remember he must be turned out every day, snow or shine—there is very little danger of over-feeding oats and bran; a few carrots once a day are excellent. Do not use corn at all the first winter, unless, perhaps, one or two ears in very cold weather. Bright clover hay, if free from dust, is much to be preferred to timothy, but it should be fed twice or thrice daily and not in large quantities. Many colts are fed too much hay—it is both wasteful and injurious.

Care should be taken to see that the colt's feet are kept right and not allowed to grow too long nor pointed outwards or inwards. While the foot is in a soft, cartilaginous state, as it is during the first year, it is a simple matter to train it with an ordinary pocket knife and so prevent the habit of "toeing out" or "toeing in," which not only interferes seriously with the animal's value when grown, but, in point of fact, becomes a transmissible malformation descending to future generations.—*Farming.*

The Flock

SOME VALUABLE HINTS ON SHEEP-RAISING

Sheep-raising is one of the leading industries in Australia, and thousands of sheep are kept there where only one is kept in Canada. The following advice to farmers, given by one of our Australian exchanges, will be of benefit to sheep-raisers in this country:

"Every farmer should keep sheep. They help to clean the land of weeds, fertilize it, and give a profit besides, if the right sort are selected. The best sheep are those that will produce the most wool of good quality, and give the largest carcass. Where sheep are bred and kept extensively, size is not of so much importance. The smaller sheep, with a heavy fleece of superior wool, will pay better than a large animal with a light fleece, as these are shorn three or four times, and sold but once; and 1 lb. of wool each time extra, at 6d. per lb., would leave the farmer a gainer in the end. It will pay well to buy good sheep, even to sell again, as good sheep will always bring a good price. Great care must be taken not to overstock, because if the sheep get poor the ewes will give less wool, and the lambs never grow to the same size as those that are well fed from first to last. Ewes with lambs require more food than dry sheep. In buying for breeding, old ewes should be selected, if the buyer is not a good judge of sheep—full mouth, or even older—as the young sheep are generally culls, with differing classes of wool and other defects. The buyer of wool does not want four or five classes of wool in each bale, as he must sort it and resell the kinds not required in his business; therefore, he can give more for wool that is all of one class. Then suitable rams

must be procured, and these can be hired from any well-known breeder if the farmer cannot buy. Small owners would do better to hire, as they get a change more frequently, and need not be troubled with keeping the rams till next season. Rams should not be used more than two or three seasons. For old ewes use four or six tooth rams, as they match better than older animals. Always get a ram with a good fleece, nice shape, robust, and a perfect constitution. Put the ewes, when lambing is a paddock by themselves, if possible. After lambing is over, shift the ewes from place to place, as they do much better when changed in this way. When the first lot of lambs has been got ready for shearing, cull out a few of the worst of the ewe lambs and old ewes and sell to the butcher. At the next shearing cull again, culling out those that have any defect, and keeping close to one class of wool. By breeding only from the best in a few years the flock will be a good one. I have noticed that those who did not breed sheep, but only bought, appeared to make very little out of it. In buying sheep there are more risks run, which cause losses, or make the farm dirty with weeds. Sheep pay the pastor alms, and surely they ought to pay the farmer, who not only supplies his household with meat, but also has the wool, and can sell a number of lambs to the butcher at a good profit every year."

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

La Grippe seems to have visited every house in town and country, it has spared none, even the Doctors have had a taste of their own wares, and let us hope that some of them have by study of their own aches and pains found out how best to relieve sufferers in this malady.

It does leave so many little reminders behind that it takes quite a long time to recover from a severe attack. In its first start, there is no place like bed, indeed in a bad case the patient can not sit up.

In many cases it leaves the patients weak and ailing for a long time, and they need a good tonic, with careful nursing to help them to get strong again. Food that is served to them should be chosen with regard to its aid in tempting the appetite.

It should be served daintily and be made as savoury as possible, care being taken that nothing is greasy. The stomach, being in a very weak state, rejects fat. There is nothing better than a good chicken broth, made the day before it is wanted, so that it can cool and let the fat come to the top, when it is easily taken off.

How to prepare a chicken for the broth: cut off the best part of the breast, and the thigh part of the leg, and put them on one side for another dish. Smash up the rest of the chicken, with a mallet or rolling-pin, and put it into a pot with about three pints of water, a dash of pepper and salt, one very small onion, and stew the whole gently till every particle of goodness is got out of it. Drain and put it to cool, remove the fat and warm and serve a little at a time with bits of dry toast. There ought to be a pint and a half of the broth, about enough for three times, for the stomach being weak, food must be taken in small quantities for a time.

The breast might be served in little cutlets daintily fried brown, after being dipped in egg and bread crumbs; a little sprig of parsley on each cutlet will help to make it look tempting, and with a small piece of bread will make a change in the menu.

The thigh part of the leg might be broiled, or stewed, and served up with a little gravy temptingly seasoned to suit the patient; a baked potato might be added and thus the stomach will soon be got into training, and able to take stronger food.

An old fowl will be found the best for broth, but in that case it would be useless to save any part of it, as it would be too tough for eating, so, double the quantity of broth should be made from this.

FILLETS OF HADDOCK.

If you don't know how to fillet fish, let your fishmonger do it for you, though it really is a deal easier than it looks at first sight, and I believe in being able to do all such little things for myself. Should you wish to do likewise, here are the directions. Let me tell you that the very first necessity is a really sharpe knife. Take two good sized haddocks, split them up, remove the backbone as cleanly as you can, and then turn over each half, and take off the skin; cut each half into three pieces, making six fillets out of each

haddock. Let me suggest that all this can be done early in the morning, and when you are ready to cook your fish you must first dip the fillets into beaten egg, and then into finely-grated bread-crumbs, which you have seasoned rather highly with salt and pepper. Shake off the superfluous crumbs, and place the fillets in your frying pan, in which you have plenty of boiling dripping—there must be sufficient to cover the fish. As soon as the fillets assume a golden tint you can take them up, drain them free from fat, and serve at once before they lose their crispness with a lemon cut in half and a few sprigs of parsley.

SAVOURY FRITTERS.

When only a very small quantity of meat of any kind or fish is left over, this is an excellent method of using it up, and making it go as far as possible. After finely mincing it, if it is meat, or tearing it into tiny flakes with two forks if fish is being used, mix well with appropriate seasonings, and then stir it into an equal quantity of rich frying or pancake butter, after which drop the preparation, a tablespoonful at a time, into boiling clarified fat, and fry until well swollen out, daintily browned, and quite crisp. When ready, drain well, dish up a high pile on a hot dish paper, garnish tastefully with hot crisply fried parsley, and serve.

BAKED BEEF WITH MUSHROOMS.

Mince very finely a pound of cold roast beef, underdressed if possible, and mix it with six ounces of stale bread crumbs, then add a good seasoning of salt, pepper, and mixed powdered herbs, two ounces of butter, slightly melted, a little finely minced boiled onion if the flavour is relished, a teacupful of good beef gravy, and three well-beaten fresh eggs, and mix the whole well together, after which turn the preparation into a buttered pie dish, and cook in a brisk oven for about three-quarters of an hour. When done enough, turn out the baked beef on to a nice hot dish, pour some carefully stewed mushrooms round about, and serve at once.

PORK CAKES.

Take the meat, fat and lean together, in suitable proportions, say three ounces of the former to half a pound of the latter, and mince it small, then

put it into a basin with four ounces of bread crumbs which have been soaked in milk and squeezed dry, a pleasant seasoning of salt, pepper, made mustard, and powdered sage, a small quantity of finely minced boiled onion, and two large well-beaten fresh eggs, and pound the whole to a smooth paste; make this up into round cakes two inches and a half in diameter, and about half an inch thick, and after coating these in the usual manner with beaten egg and bread crumbs, fry them over a quick fire until nicely browned on both sides and quite firm. Now have ready some boiling hot, well-made sage and onion gravy, and into this lay the cakes after draining them very thoroughly from the fat, and simmer as gently as possible for five or six minutes. Meanwhile, arrange in the centre of a hot dish a thick flat bed of mashed and seasoned potatoes, and cover this with a thick layer of finely chopped seasoned cabbages, or greens of some sort, then when the cakes are ready, dish them up neatly upon the vegetables, pour the gravy over all, and serve quickly.

It is said of a wise and witty Frenchman that asked by a young mother at what age she should begin to teach her child to be obedient and truthful—could it possibly understand at two years?—he shook his head and said, "Earlier than that;" when she pursued her inquiries to one year, six months, three months, one month, he still shook his head and replied, "Earlier, earlier," until, having reached the point of one day, she asked in despair, "What did he mean?" and received the reply, "If you want to train a child in good habits you must begin with his mother, twenty years before he is born." And may we not add with his father, too? So great are the forces of heredity and so tremendous that of example that it is all but hopeless to try to teach honesty, obedience, self-reverence, and self control to children whose parents do not possess such qualities and show them in their daily lives. But, ever when heredity and example are good, and a child surrounded by those on whom it does well to exercise its marvellous powers of imitation, active teaching and training are needed.

WEIGHING THE BABY.

I know that weighing a baby is by many people regarded with superstitious horror, why I cannot

tell, since by this means we may ascertain to a great extent whether the child is developing or otherwise. A child from birth to about six months of age should be weighed weekly. During the first week after a child's birth there is generally speaking a slight loss in weight, but by the end of the second week the child should have regained its birth weight, and if there is a gain of less than four ounces weekly, or a stationary weight, a mother will know that there is some fault in the child's nutrition. Either the quantity or quality of the milk is in fault, or its power of assimilation is weak. So you see that instead of being unlucky to weigh your baby, it will be a good guide to you as to whether the little one is really thriving as it ought to do.

LET THE BABY SLEEP.

A young baby should spend most of its time in sleep. Never allow it to be wakened for any purpose whatever. A child's nerves receive a shock every time it is roused from sleep, which is most injurious to it. Admiring friends should be made to wait until it is awake, to kiss it and play with it. After it is nursed at night put it back into its crib, and if it is comfortable it will soon fall asleep. It should never sleep in the bed with an older person. Place the crib with its head to the light so as to protect the eyes from the glare. A light canopy serves to ward off draughts. Curtains cut off the supply of fresh air, and except a mosquito-netting in summer, should not be used. Until a child is two years old it should spend part of its day in sleep, taking a long nap morning and afternoon.

Correspondence.

To the Editor of the JOURNAL OF AGRICULTURE :

The changes, the modifications, the developments that have taken place in the practice of dairying, within recent times, amount in many districts to a transformation, so far at all events, as the manipulation and the disposal of the milk are concerned. The transformation, has been in a way almost kaleidoscopic, and that in no insignificant degree, inasmuch it has been rapid, novel and interesting. The metamorphosis, however, has not hitherto been, and in the future is not likely to be, on one line, or in one department

only, though some of its features are not, so far as we can see at present, open to any change which goes beyond a modification or an improvement in details, leaving the details unaltered or a change in methods without a disturbance of principles. The adaptability of dairying as an industry, its ready amenability to the demands of the times, that are not what they were, its supple responsiveness to the more or less progressive moods of the period in which we live, have demonstrated in this latter half of the nineteenth century as they never were before, as indeed they never before had any reason to be. And the modifications, developments, transformations—call them what we will—are still in progress, for the little leaven of a quarter of a century ago has not leavened the whole lump. Much has to be done. Surely we in Canada are convinced that our competitors abroad have obtained a high degree of excellence in the making of cheese and butter, and are still pushing to a still higher excellence. In butter-making, more especially, several countries have taken and kept the lead of us, as far as method and uniformity in results are concerned. From whatever country the best butter is obtained, the product emanates as a rule from large dairies or creameries. We venture to hope that the small creameries will ere long become merged into larger establishments, in order that uniform products of good quality may take the place of those which are now disappointing alike to maker, dealer and consumer. We must admit that although some farmers make a really good article, they bear but a small proportion to the whole production of Canada. We are more free to declare our conviction that, in respect to private dairies which do not and cannot turn out really good butter, the future looks bad enough. Now what is the remedy for this trouble? In a district where a sufficient quantity of milk can be obtained within a convenient radius, the centrifugal separator is the best thing. Several of these stations, could be established, within a convenient radius. These stations could be established on the farmers' co-operative system, which would not tax the farmers' capital to any great extent. Each of these cooperative districts could be looked after by a committee of the farmers contributing to the erection of them, who would engage a competent manager to take charge of the separator, keep the accounts, and give each day a receipt to the farmer for the amount of cream his milk produced.

These several stations would send their cream to a central dairy or creamery, where it is purchased, and the different combines could arrange with the proprietors of the creamery about the price to be paid for the cream.

The great advantage of these large central creameries, will be the greater uniformity of the butter, which will realize a higher price and a surer market; thus, enabling the manufacturers to pay the highest price for the cream.

Most of our farmers object to winter dairying, so common amongst the Danes. If they, in a cold inhospitable climate, can produce winter butter, why cannot the Canadian, with so many advantages, compete with them? This is a sort of conundrum not easily answered. The best of fodder can be grown and cured for winter consumption.

It is at this time of the year the farmer has the least out of door work to do, and can carry his milk to the creamery with least labour. I know many farmers say this is the time of year he likes to give his cows a rest, but July and August are better months, when the farmer has the busiest time in the hay and in the harvest field.

It is only by a union of interest and action that the product of milk can be successfully manipulated.

AYLMER.

SCHOOL OF AGRICULTURE AT STE-ANNE DE LA POCATIERE.

On December 22nd, MM. Auguste Dupuis, President of the Council of Agriculture, R. Ness, and A. J. Daves, paid an official visit to the Agricultural School and Model-Farm at Ste-Anne. The different departments of the farm, the creamery, the fine herd of Ayrshires, the piggery, the sheep-sheds, were, each in its turn, the objects of their attention.

In the afternoon, the Revd. P. Richard, head of the school, in presence of the distinguished visitors, questioned the pupils on the different points of practical farming, and on agricultural chemistry. This examination, which lasted for two hours, was highly satisfactory.

In the evening, the Revd. D. Pelletier, the Superior of the College, and several professors, were present at the final examination of the pupils. The first prize in agriculture was adjudged to M. Wilfrid Boulet, of St-Félicien; the second, to M.

Wilfrid Lambert, of St-Joseph de Beauce, Louis Côté, of Méchins (?), Adolphe Lapointe, of Malbaie, Honoré Pinsonneault, of Quebec, Amédée Tessier, of Beauport, Aimé Boutet, of Beauport, Eugène Jalbert, of Lac Bouchette; the fifteen pupils of the school intend returning in February to continue their course of study. MM. Boulet and Côté mean to take their degrees in agriculture, on which determination we must congratulate them.

(Signed) D. PELLETIER, Priest.

Ste-Anne, Dec. 23rd, 1898.

CENTRAL EXPERIMENTAL FARM.

OTTAWA, January 13th, 1899.

DEAR MR. JENNER FUST,

It has been pressure of work only that prevented me during 1898 contributing as formerly to your columns. It was a very busy year for us, and the work despite all efforts *would* accumulate.

The article I enclose is one that I've had in my mind for some time. It is the result of the examination of many claysloams from your province and of the testimony I have received from not a few farmers as to the benefits to be derived from the treatment I have suggested. I trust the information it may impart will be for the bettering of agriculture in Quebec.

In the course of a few days I shall be able to send you a copy of a bulletin on Farm-yard manure, which is now in press. I think it will be a serviceable bulletin. I'm also giving details in my annual report on some interesting and instructive investigations we have been conducting on the preservation of manure.

Wishing you a bright and prosperous New Year.

Yours faithfully,

FRANK T. SHUTT.

The Farm.

THE TREATMENT OF HEAVY CLAY LOAM

By Frank T. Shutt, M. A., Chemist, Dom.
Expt. Farms.

In the province of Quebec there are several large agricultural districts in which the soil is a stiff clay. Many samples of such soil have been receiv-

ed during the past ten years at the Experimental Farm Laboratories for examination. Analysis has usually shown that their chief deficiencies are organic (vegetable) matter, nitrogen and lime. Further, the mechanical condition or tilth of these clays is, as a rule, most unfavourable for crop growth. The suggestions made by the writer for their economical improvement have in so many instances been followed with such marked success, that he deems the following summary as regards the treatment usually advised may prove useful to readers of the "JOURNAL OF AGRICULTURE" who are working such soils.

I. *Drainage and Culture.*—In order to bring about that mellow condition which alone makes a soil suitable for seed germination and root extension, it is absolutely necessary that heavy clay loams should be thoroughly drained. Unless this is done, the soil will not be thoroughly permeated by air, nor allow the percolation of water, conditions without which it is useless to expect good crops or to obtain the maximum benefit from the manures applied. The fertility of a soil does not altogether consist in the amount of plant-food it contains, and it is indeed foolish to be buying commercial fertilizers while the soil, for want of drainage, remains impervious, unabsorbent and compact, baking into clods during seasons of drought, and suffering from surface washing and gully formations during the rains.

Not only will drainage make the soil porous and absorbent, furnishing air and moisture as needed to the growing crops, but it will enable the farmer to get his seed in two or three weeks earlier than would otherwise be possible. This is a very important matter, especially with the cereals; the delay of ten days or a fortnight after the season opens in sowing frequently means a considerable reduction in the yield.

As regards culture, it need only be said, that, as far as practicable, such soils should not be worked when wet; nothing is more injurious to that mellow condition already referred to as being most desirable. Nor is it advisable to plough such soils to the same depth year after year, for in so doing the share will compress or plaster the soil immediately below the furrow, rendering it to a large measure impermeable to water and impenetrable to roots.

We would also point out the damage done to such soils, especially when not drained, by cattle in wet weather, where by the land is "puddled"

(*poached*) and good tilth destroyed. Many an excellent pasture has in one season been so seriously injured by this cause, that years of skilful management were required to bring it again into good heart.

2. *The Application of Lime.*—This is undoubtedly the chief remedial agent for such heavy soils as we are now discussing. Numerous analyses made in the Farm Laboratories have demonstrated the poverty of these clays in this element and we have the testimony of many practical farmers who have applied it at our suggestion, to the great benefit derived from its use. We use the term "poverty" advisedly; we do not mean that these soils are entirely lacking in lime, but that they do not possess sufficient for good returns. Lime is a constituent of all plants, but in clay loams it serves several useful purposes, in addition to acting as a direct plant food. It vastly improves the tilth, making the soil mellow and friable. It helps to set free mineral plant-food—locked-up and unavailable in the soil—and this is especially true of the stores of inactive, because insoluble, potash always present in clays. For these reasons, heavy soils require and respond to lime more than sandy loams. The writer is in possession of many letters from farmers testifying to the largely increased yields from a dressing of lime on such soils as are now being discussed.

We do not counsel a heavy application at any one time. Lime has a tendency to "work down", and so get beneath the reach of the roots of growing crops. Forty (40) bushels per acre may be stated as an average dressing, to be repeated, say, every fifth year. (1) The lime placed in heaps of, say, 2 bushels upon the ploughed field and covered with moist earth will thoroughly slake in a few days, when it can be easily spread and harrowed in. Where marl, (carbonate of lime) is cheaply and easily obtained, larger applications may be made, for an excess of this fertilizer can do no harm. A deposit or layer of marl is frequently to be found underlying the muck in our swamps and bogs.

3. *Organic Matter and Nitrogen.*—It is practically impossible to have good tilth with out a fair proportion of vegetable matter in the soil, and especially so is it the case with clays. Clays

(1) The average clays in Scotland used to get 200 bushels at the beginning of the 19 years lease; as nearly as possible 40 bushels every 5 years. Ed.

devoid of humus (semi-decomposed vegetable matter) are "dead," that is, are destitute of germ life, so essential, as we now know, to fertility. Humus helps to destroy the plasticity of clays, to make them warm, to make them more retentive of moisture, to make them better suited in a great many ways for the growth of crops.

Of nitrogen, it is only necessary to remind the reader that it is one of the three essential elements of fertility—a requirement of all plants—and that, in a large degree, the crop-producing power of a soil is measured by its percentage of this constituent.

Barnyard manure, of course, supplies both humus-forming material and nitrogen, but unfortunately on the majority of farms it is not produced in sufficient quantity to make the desired improvement in the soil. It must, therefore, be supplemented. The sources we suggest are two: "green manuring",—that is, the turning under of a green crop—, and composted swamp muck.

The advantages of growing for manurial purposes clover, peas, or some other legume, have been demonstrated in the reports of the Experimental Farms of the past few years. The legumes have the ability to appropriate free nitrogen from the air—a quality possessed by no other class of plants. This nitrogen is stored up partly in their roots; partly in the stems and leaves. These, on decaying in the soil, not only enrich it in vegetable matter, but yield their nitrogen in forms suitable for the use of our ordinary farm crops. We shall not now enter upon a full discussion of the many benefits of green manuring, but it is an instructive fact, and one that should be thoroughly realized by all farmers, that by turning under a good crop of clover as much nitrogen can be furnished the land as is contained in 10 to 15 tons of manure.

Clover—common red or Mammoth—can be sown with all kinds of grains, 8 to 10 pounds of seed to the acre, without lessening the yield of grain. After the grain is harvested, the clover grows vigorously. If there is stock on the farm to eat it, it should be fed and the resulting manure, which contains 70 per cent. of the nitrogen of the clover, returned to the soil. But if not, and the land is required the following spring for early seeding, it should be ploughed under at the close of the season. If it is intended for corn, ploughing under should be left till the following May, when there will usually be a good growth. This practice, also, is advised for orchards, for the clover

acts as an excellent cover-crop during the winter.

Swamp muck, naturally, is variable in composition, but an average sample, after drying by exposure, contains between 50 and 75 per cent. of organic matter, and between 1.0 and 2.0 per cent. of nitrogen. To make this latter element available as plant food, the muck must be fermented. Air-dried-muck is an excellent absorbent and may be used to advantage about the farm building to take up liquid manure. In conjunction with straw, it thus serves a most useful purpose in the cow house, the pig-pen, the fowl house and the barnyard, preserving plant-food that otherwise would be lost. The subsequent fermentation in the manure heap converts its plant food into assimilable compounds.

Again, if the manure of the farm is rotted before being applied to the soil, it will be found a good plan to build the pile of alternate layers of muck and manure, for the former will help to retain the liquid part of the manure from draining away and at the same time keep the whole mass moist—a condition essential to avoid fire-fanging. By this means not only is the bulk of manure increased, but both muck and manure are benefited.

We have in this article purposely avoided details and lengthy explanations, for it was the intention to emphasize the special needs of these clay soils and the most economic methods of supplying them, leaving particulars for consideration on a future occasion. The first desideratum is that the farmer should realize what his soil wants to improve its fertility, and the cheapest ways of furnishing it.

FRANK T. SHUTT.

The Orchard and Garden.

(CONDUCTED BY MR. GEO. MOORE).

THE FARMER'S GARDEN.

It is a common thing to hear a farmer, at least one of the old school, exclaim "Oh, I have no time for gardening. These men who are continually complaining that they have no spare time are not always the most industrious, and if they were watched, it would be found that they wasted more time than would serve to cultivate a garden.

It is true that there is always a rush of farm work in the spring and not much time can be lost

if the crop is to be got in, in good season but the garden crop will not take long to plant if the preparation for it has been made in the fall. It must not be considered that the garden is merely for fancy, but that its cultivation is a part of the economy of the farm, and that its products will be as good as cash when reconed with the household expenses.

There are a great many light jobs that can be done by the youthful member's of the family, such as sowing the seed, weeding, thinning, spraying, trimming the bushes and gathering the crop and even the ladies are not averse to take a hand when occasion requires. I know several who consider it conducive to health to work among the newly turned up soil, and do so with that purpose in view; with satisfactory results in that respect, beside the pleasure and profit otherwise accruing from a well cultivated garden. A garden has a good effect too upon the social condition of the family. The children learn to love it, the young people take an interest in it and it makes them love their home, a sentiment too little encouraged. It is too late now to commence the making of a new garden, as the ploughing should have been done in the fall, but even now if you have a piece of good land near the house there is no reason why some garden crops should not be planted, for instance a few rows of early peas and beans, some early turnips and carrots; these will be found useful and perhaps will induce the "Old man" to have a piece well and deeply ploughed for a garden next autumn.

If so, have it as near the house as you can, so that some one can do a little work at odd times, as a means of recreation. The pleasure, health, and profit that can be found in a garden are blessings he who despises it fails to enjoy, neither does he do his duty for he neglects to make the best of the opportunity to add to the happiness of those who are depending upon him.

HARDY PERENNIALS.

This beautiful border plant belongs to the family of the Primulas, although it is commonly called the American Cowslip. The foliage is very pretty and the flowers which are similar in form to the cyclamen, are produced in a cluster on the summit of a stem about 1 foot high. The color of the one illustrated (*Meadium*) is reddish purple

with orange yellow eyes. Other varieties are *D. integrifolium* pink and *Jeffreyanum*, white to deep rose, all are well worth a place in the flower



Dodecatheon Mead.um.

garden, it blossoms in June and July, thrives best in moderately light loamy soil which is cool and a little moist and enjoys a somewhat shady situation.

JADOO FIBRE AND JADOO LIQUID.

These two comparatively new materials to aid in the cultivation of house plants are being extensively endorsed by growers in Great Britain and the United States. The fibre is used to pot plants and take the place of soil, and it is claimed that it answers the purpose better, because it is dense enough to hold the plant in position and yet porous enough to allow the roots to penetrate it freely. Jadoo liquor is a concentrated plant food in solution. The Jadoo Company of Philadelphia publish an elegant pamphlet describing the article, and full of testimonials from many eminent plant growers both in Europe and the United States. Mr. A. M. F. d'Eschambault, of the Department of Agriculture, Quebec, has some Begonias grown by this means and they are remarkable for healthy appearance and richness of the color of their foliage.

AGRICULTURAL EDUCATION.

In view of the fact that the education bill now before the Quebec legislature provides for agriculture to be taught in all rural schools, it will be well to note what a Royal Commission appointed to enquire into the subject reported: "We believe," it says, "that it is essential to the welfare of agriculture that there should be placed within the reach of every young farmer a sound general school education, including such a grounding in the elements of the sciences bearing upon agriculture as will give him an intelligent interest in them and make him familiar with their teachings. All cannot have the privilege of attending an agricultural college, but if they are well grounded in the elementary knowledge of agriculture they will be able to understand and profit by any information which may come within their reach."

"The Apple-King."

Mr. John Wellhouse of Kansas is the King of apple growers. His orchards consist of 1,630 acres and contain 100,000 apple trees. He still continues to plant more.

HOW SCIENTIFIC RESEARCH MAY BENEFIT THE FRUIT GROWER.

Entomology, in itself is a very interesting science, is most useful in its application to the orchardist and his work. It can scarcely be expected that every fruit grower can be an accomplished entomologist, and yet it is well that he should acquire some knowledge of insects so as to be able to take means to prevent their ravages upon his crops.

I am led to these remarks by noticing the good work Dr. Howard, entomologist of the United States Department of Agriculture has been doing and how closely he must have watched the habits of certain insects to enable him to succeed.

Discovering that an Australian beetle, *novius cardinalis* preyed upon the scale insect of the orange, specimens of which had been imported to California to aid the growers there in the extermination of the scale, he sent a lot to Portugal, consisting of only a few beetles with some larvæ and now these have multiplied by millions and

are fast ridding Portugal of the scaly pest. Thus, the studies and observations of men of science are made of practical use and should lead us to understand that the public money applied for the purpose of enabling such men to prosecute their research and disseminate the knowledge they acquire is not squandered.

It is curious to note too how insects prey upon each other.

E'en little fleas have other fleas
Upon their backs to bite 'em
And they again have other fleas,
And so, *ad infinitum*.

A FEW FARM APHORISMS.

The good farmer strives to be so because, as a sensible man, he prefers :

Knowledge to ignorance.

Peace of mind to dissatisfaction and wrong.

Power to weakness.

The respect of his fellow men to scorn and derision.

Serenity to storms of ill feeling.

The society of the intelligent to that of the frivolous.

Domestic happiness to continual turmoil.

Victory to defeat.

Affluence to poverty.

Let all crops be carried off on four legs. (And no oatmeal, no bread, no malt? Ed).

Increase fertility rather than acreage.

Be a model to your neighbour.

Don't envy a man his good cultivation, but try to excel him.

The earth, your brain and your good right arm are, under Providence, your best friends.

If success makes a man proud and selfish, he is not to be envied but to be pitied.

There is no absolutely independent individuality, every man's doings have a reflex influence upon his neighbour. Therefore, to be a good or bad farmer is to be a philanthropist or a misanthropist.

VEGETABLE POISONS.

Most vegetables contain poisons of different degrees of virulence and some of them of the most deadly nature, as for instance the "night shade"—*atropa belladonna*,—strychnine, a product of the

terribly dangerous shrub *strychnos nux vomica*, etc, and with these every one who lives in the country should make himself acquainted so as to avoid accidents. It is interesting in this connexion to remark how the natural instinct of cattle prevent them from eating poisonous herbs and fruits, and how readily they will select and reject them should they be mixed with their forage. (1)

But it is necessary to observe caution as to many of the more beautiful and common garden plants, some part of which may contain poisonous qualities. Many bulbs are especially to be avoided, as the Autumn crocus, Jonquil, Narcissus, Snow-drop, Hyacinth, the Cardinal flower (*Lobelia*), the Poppy, Euphorbia, Daphne, etc. And not only the poisons affect the system by being taken into the stomach but by being inhaled into the lungs, or absorbed by the skin, as for instance the sting of the nettle or the irritation caused by poison ivy, etc.

It is well that the young should be cautioned about these poisonous plants and made familiar with them.

STONE AND STUMP LIFTER.

The ancient philosopher said that if he had a fulcrum, with a lever he could lift the globe. This I have just seen illustrated by the Lemire stone and stump lifter as I had an opportunity to see it work on the farm of Mr. J. B. Boivin, of Charlesbourg, and the facility with which it lifted stones of enormous weight and by leverage which could be worked by a small boy was remarkable.

In less than an hour six of these large stones were lifted clean out of the solid ground and deposited at the required place. It is a most ingenious and effective machine, strong and well made, not easily put out of order and will make it possible to improve stony or stumpy land with comparatively little expense.

NOTES ON THE ADVICE ON FRUIT CULTURE BY THE REVEREND FATHERS TRAPPISTES.

(Continued.)

The Reverend Fathers have done well to call attention to the soil on which to plant fruit trees, for this is a consideration too frequently overlooked. But it

is doubtful whether or not it would be unwise in some cases to attempt their culture at all, as, for instance, on low black soil, which if it were not replaced entirely by calcareous soil or clay it would be impossible to improve, or if it were, it would be at such a cost as would not warrant the outlay. Situation has a great deal to do with success, and an orchard in a low, damp locality would fail to give profitable results however good the soil might be: this remark applies more forcibly to Lower Canada, where our summers are so short and our winters so severe.


It is gratifying to find that the authors fall into my view, which some others do not, namely, that a southern exposure is not the best for an orchard on account of the danger from the direct rays of the sun after a severe night-frost in the spring. They say that by this the roots and young shoots will be damaged; but my experience is that, not only these but the whole stem will often be destroyed, the bark will crack open and look as if it had been scalded and the tree will not only be injured but absolutely killed.

The remarks on manuring are admirable and should be studied carefully, many a young tree has been destroyed by the application of fresh unrotted dung, no doubt liquid is the best to continue the manuring after the soil has been well prepared.

Planting the trees too thickly, so that the air cannot circulate freely among the branches, and allowing the surface of the land to become solid, or too early covered with turf, so that it cannot reach the roots, are common mistakes. Light is also of as much importance as to the maturing of wood and fruit as free circulation of air. A small orchard came under my notice recently, which up to the present time has been a great success, but the trees were planted too close together and just at the time when they should be the most prolific they are suffering for want of air and light.

With regard to the strawberry, the statement is correctly made that the runners should *all* be cut off. There is nothing said about any being reserved to give us young plants to renew our beds. Of course this should be done, as it is well known that old roots of the strawberry will not transplant. After this reserve is made, the whole of the runners must be destroyed as they appear.

(1) How about the berry of the *yew-tree*, in England? Ed.



Live Stock.

ACCIDENTS AND DISEASES AMONG BREEDING STOCK.

In a former series of articles I have dealt with the misfortunes that occur to ewes and lambs at lambing time. The stockowner is however aware that all kinds of stock are liable to suffer from accidents and diseases during the critical times of gestation and parturition. Sheep breeders have, perhaps, the largest share of troubles to meet but horse and cattle owners are not exempt, although breeders of horses are not subject to so many and varied mishaps as are flock-masters and breeders of cattle.

Among the diseases and accidents which are incidental to the period of gestation, abortion ranks first in importance. Cows are undoubtedly most liable to this mishap, and although practical men and scientist, have studied the matter for many years, it is still true that the cause or causes of the disease are very imperfectly understood.

Abortion is one of the diseases for the prevention of which numerous suggestions have at various times been offered. But the most competent and experienced observers, are ready to confess that all kinds of management have failed, and further that, under the most perfect system of treatment, the losses are frequently serious.

It is obvious that certain broad principles of management must be accepted and strictly adhered to by breeders of horses, cattle, and sheep, if they expect their efforts to meet with success: but the unsatisfactory outcome of the most carefully devised system is calculated to discourage the most sanguine.

Everything which sanitary science can suggest may be adopted: breeding animals may be carefully fed, well sheltered, protected from injury or undue excitement or exertion, and notwithstanding, abortion may occur in a large proportion of the herd, and the breeder will be utterly unable to explain the occurrences; indeed will fail to obtain the slightest clue to an explanation.

Years ago, in England, I was talking this matter over with a thoroughly practical breeder, and he said, as nearly as I can remember among other things: "I have often thought that Government might do much more than it has done in the effort to elucidate and stamp out a disease or complaint

that has such a terrible effect in keeping down the cow stock, for each year sees thousands of calves sacrificed to its ravages.

"Many doubt whether this is contagious simply. I presume for the same reason as most doubters, namely that they have not had experience of its subtle phases.

"Should they however, ever have the contagious form in their herd they will no longer doubt. There are so many causes leading up to contagious abortion that it is difficult to say from which the animals are suffering. Cattle may cast their calves from fright excitement, a sudden wrench caused by the unexpected bite in the heel by a dog, the eating of grass infested with *ergot*, drinking of impure water, or when water holes are situated at the bottom of a steep incline causing the animals, so to speak, to stand on their heads whilst drinking. The contagious phase usually exists for three years, and, if no fresh infection be brought on the farm, naturally dies out at the end of the third year: if new infection be brought in; and it can be conveyed by all the means by which foot-and-mouth disease can be carried; then it has been known to extend eight years, the losses in calves varying from 50 to 90 per cent over each year.

We have fought and are fighting foreign-imported, pleuro-pneumonia and foot-and-mouth disease, yet shut our eyes to a disease that annually costs us more calves than the two above named added together."

This and much more which I forget, my informant imparted; he then being in the position of a very experienced observer, which he should have been to announce in such definite terms the period during which the infection remains active on a farm.

The question of contagion occupies at least a very dubious position, and the different outbreaks that have occurred have seemingly presented very few facts on which the contagion theory could be defended.

I believe it to have been shown that certain bacilli exist in fluids derived from the foetal and maternal tissues in cases of abortion, and that the introduction of these organisms into the system of a pregnant heifer will induce abortion. The experiment is not complete. It ought to be shown that, in such circumstances, organisms derived from septic tissue are *not* capable of causing abortion.

Even if the view taken of the contagious character of abortion be accepted, the conclusion is still incomplete: because every stock owner is satisfied that the disease arises frequently under circumstances which exclude the idea of specific infection. To begin with simple causes: mechanical injury leading to rupture of foetal membranes will cause abortion. The same result follows excessive excitement or violent exertion. Acute disease is dreaded by the breeder, not so much on account of the danger attending the progress of the malady as the risk of abortion.

It is clear from long observation that injury, nervous irritation from fear, or other kinds of excitement, violent exertion, and acute diseases are causes of abortion. Consequent abortion cannot be a contagious disease in the ordinary acceptation of the term: but it is one of the special features of all true contagia that they only arise from virus emanating from a previous case, whereas abortion does constantly occur independently of a previous case.

An outbreak of foot and-mouth disease among sheep under ordinary conditions was not looked upon a terrible infliction: but the presence of the affection in a flock of breeding ewes meant the ruin of the breeder's hopes of a successful lambing time.

The lambs were not lost from foot-and-mouth disease, but simply because the effect of the malady on the ewes resulted in the expulsion of the foetus before it was capable of living a separate existence; in fact, any acute disorder during gestation is likely to induce the premature expulsion of the foetus.

It is well known that when a case of abortion occurs in a herd of cows, it is important to bury or otherwise effectually dispose of the foetus and all products of the accident, and to remove the remaining cows from the pasture, otherwise it is believed that other cows will suffer, and it certainly does happen as prognosticated in many cases; but this leaves the question of infection quite untouched, as the excitement and alarm in a herd from the occurrence of a case of abortion in one of their number sufficiently accounts for the extension of the disease without referring to the influence of contagion.

That a form of abortion may exist in which contagion is the active agent need not be disputed. But it is contrary to common experience that

contagion is in any way concerned in the majority of cases.

Possibly, if the full history of all the cases of abortion could be obtained from the time of the commencement of gestation, a great deal of the mystery which is associated with most of the outbreaks would disappear: but the enquirer has often to confess that his investigations are without the disclosure of any circumstances which seem to bear a causal relation to the disease. There are several reasons for this common failure. For one thing, the causes which have culminated in abortion may have acted some considerable time before the event happened.

Neglect to carry out the prescribed system of management in all its details will certainly be concealed, and in a certain proportion of the cases the cause may have entirely escaped everybody's observation. The sudden incursion of a stray cur in the middle of the night may produce extreme alarm among a lot of in-calf cows or breeding ewes, while the dog may escape and leave no trace of its visit.

For these and similar reasons investigations undertaken by an expert from a distance are rarely successful in elucidating the mystery, and when the true cause is found out, it will generally prove to be something of an accidental kind, which may or may not recur, and in any case cannot always be guarded against under the most perfect system of management.

W. R. GILBERT.

The Dairy.

THE FEEDING OF DAIRY COWS.

In the course of the paper on the "Feeding of Dairy Cows," read by Mr. Douglas H. Gilchrist, B. Sc., Director of the Agricultural Department, Reading College, at a recent meeting of the Milborne St. Andrew (Dorset) Farmers' Club, he said that, to a small extent, the quality of the milk could be improved by judicious feeding, but not nearly so much as it was at one time supposed, the breed and individual peculiarities of different animals having far more to do with the quality of the milk produced than had the feeding. An increase of oil or fat in the food of dairy cows did not seem to have much effect in increasing the

quantity or quality of the milk. For this reason probably the harder pressed and cheaper oil cakes, such as linseed cake, were more economical for the feeding of dairy cows, whereas for fattening cattle the best results were given by cakes rich in oil, these, although dearer, being for this purpose more economical. In summer, when pastured was abundant and of good quality cows in full milk did very well indeed without additional food, but from 2 to 3 lb. undecorticated cotton cake per day was often a useful addition. Undecorticated cotton cake had rather a costive tendency, but this was useful rather than otherwise when the cows were at pasture. This cake would also have a good effect on the facture as the droppings of the cattle were made much richer. For winter feeding the following had been found to be a useful ration for cows in full milk ;—Six lb. bean meal, 2 lb. oats (bruised), 2 lb. bran, 1½ lb. linseed cake. 28 lb. turnips, 10 lb. cabbages, 15 lb. oat straw (partly chopped.) In replying to the discussion which followed his lecture Mr. Gilchrist said that the principal heads of his advice might be recapitulated as follows :—(1) Let the foods on the farm be as near as possible those suitable to the dairy stock and the land ; (2) Get a rough idea of what the food is deficient in, and then buy the food most nearly representing the deficiency ; (3) Try to realise what is wanted for the different classes, of animals ; (4) Then, with the aid of tables, get the feeding-stuffs reduce to a fairly manageable form. The paper, we may add, has been republished in pamphlet form.—*Ag. Gazette.*

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**DR. McEACHRAN'S REPORT ON THE
GERMAN PLAN FOR SECURING
UNTAINTED MILK.**

The milk supply of the large cities in Germany has for many years been the direct concern of the municipal governments of those cities. The importance of the subject seems to have been recognized there sooner than in any other country. During his visit to Germany Dr. D. McEachran, Chief Veterinary Inspector for the Dominion, made a careful investigation into the milk supply of the various large German cities. The largest and best equipped service he found in Berlin. Speaking about the history of the movement for a purer milk supply in that city he says :

"In 1881 the first steps were taken to provide

Berlin with pure and cheap milk as well as good dairy produce, and a small building was opened for that purpose with three sale waggons. In less than two years this was found quite inadequate, the public sympathy being so fully offered to the enterprise that it became necessary to construct at once a central dairy on much larger dimensions. These buildings were gradually increased in size, and the business done became so extensive that sixteen years later when I visited the institution, instead of three sale waggons being employed, as at first there were one hundred and fifty-nine.

POPULARITY OF THE PLAN.

"Regarding the distribution of milk itself at the end of the first year of the enterprise nearly two million and a half litres were supplied to the city and in 1896 nearly twenty-seven million litres. At present the daily quantity produced, seventy-five thousand litres, meets the needs of some forty-five thousand householders and is obtained from dairies containing in all fourteen thousand cows.

"In connection with the production of this milk the following statistics may be of some interest. For the proper working of the apparatus necessary for the cleansing of the vessels containing the milk a daily quantity of from twelve thousand to fourteen thousand kilograms of coal is employed. The place is lighted by sixteen hundred incandescent and fifty-two arc electric lights and the power necessary is supplied by three dynamos of over a thousand amperes. In connection with the institution there are twelve hundred workmen many of them specially employed and retained in special houses, such for example as locksmiths, tinsmiths, saddlers and other like workmen, and a special printing house has been opened in connection with the institution. About one hundred and eighty waggons and two hundred and forty horses are required to carry on the delivery work as it is at present. Not only do the waggons carry ordinary milk but likewise whey ; the best fresh milk for children, sterilized milk for children, cream, skimmed milk, buttermilk, butter and various kinds of cheese, and arrangements are made whereby various kinds of fresh fruit are carried about on the same waggons.

"Having collected the milk from about one hundred and thirty different sources, there are daily brought to the dairy about seventy-five thousand litres. This having been tested as

TO ITS GOOD CONDITION,

it is then for the most part filtered through gravel, and in this way is freed from the presence of a large number of micro-organisms, and is then rapidly cooled and brought to the consumers in this form. The second portion is centrifuged, thoroughly cleansed and divided into cream and skimmed milk. In this way cream is reduced to two different qualities, or is used for the manufacture of butter, the yearly production of which is 250,000 kilograms. The skim milk produced is very much favoured and is a cheap form of nutrition. About ten thousand litres of this are sent out daily. A third portion serves for the manufacture of cheese in which the soft cheese of the French variety occupies the most prominent place Roquefort, Camembert, etc. Two million litres of milk are employed in this way every year. This cheese is sent throughout Germany to all the larger cities of the Empire where it is in great demand.

“What is called children’s milk is obtained from farms whose cattle have the whole year been fed on dry food. The strictness with which Berlin has thus provided for unadulterated milk has had most favourable results in the quality of the milk, and the improvement of the milk in general has been most marked and has resulted in the diminution of the adulteration with water of from 14.1 per thousand in 1879 down to 3.6 per thousand in 1886, as testified to by

THE OFFICIAL INSPECTION.

“There is undoubtedly, too, another evidence of this benefit in the diminution of mortality in children, whereas during the years of 1871 to 1880 thirty per cent. of children died in the first year. In 1881 it was lowered to twenty-seven per cent., and in the present year down to 28.8 per cent. While of course, undoubtedly, other factors have played an important part in the improvement of mortality; such as improved dwelling places, sewers, etc., nevertheless the improvement of the milk, which is almost the only nourishment for children under one year, must be recognized as having the greatest influence in this respect.

“From the small developments mentioned above up to the great increase in milk supply and analogous products there has been a further development as a result of the same enterprise. The by-products in the manufacture of cheese, butter, and such like products must be mentioned, such ar-

ticles as lactic acid, lactose and various preparations of casein, all of which find a market in various parts of the country, as well as being exported for use in pharmacy, dye factories, paper, textile industries and like industries. So much has this become

AN ESSENTIAL FEATURE.

of the dairy that special technical laboratories have been constructed.

The bacteriological study of milk and its products has become so important in Berlin that it has been found necessary to establish an experimental station in which all the essential scientific questions concerning milk infection can be worked out thoroughly. Such, for example, is the effort to obtain in pure culture the various bacteria which renders milk infectious. In the same place inoculation experiments upon the smaller domestic animals are carried on. Feeding experiments on both the larger and smaller domestic animals are also thoroughly carried out.

“A special laboratory for the chemical analysis of milk has likewise been created. In the year 1896 no less than 21,480 analyses were made. In consideration of these various features, the existing conditions of the milk supply are the most favourable that can possibly be obtained. Formerly the various suppliers of milk carried on a wholesale milk adulteration, and at the present time, as will be seen from the analyses, this adulteration has been.

Note. — A litre contains 1.760 of an imperial pint, therefore a hundred litres are equal to 88 imperial quarts or 22 gallons, about 220 lbs. ED.

A HEIFER’S FIRST MILKING PERIOD

I question—in some degree, at least—says a writer in *Home and Farm (Eng.)*, the wisdom of the policy of prolonging the milking period of a first calver by delaying her second calf with a view of inducing the habit of prolonged milking. That training has very much to do with the making of a cow, is, I think, not to be disputed, and in all probability the loss of milking capabilities in the modern Short-horn, of which we hear so much, is due very much to the pernicious habit of letting the heifers suckle their calves or, worse still, of removing the calves to be reared by nurses and at the same time possibly fattening up the heifer for show purposes. No beast with any

common sense would continue to produce milk under such circumstances. Whether, however, the plan advocated is the best, is, I think, matter for question. No doubt, by delaying her second calf we may prolong her full milking period almost indefinitely, but under somewhat unnatural conditions, and it is very doubtful whether the fact of her having been milked for a lengthened period under such conditions would at all effect her under the altered conditions following her second calf. Besides, is it desirable to have a cow milking forty-eight or fifty weeks out the fifty-two? I think not. Cultivate the habit of milking by all means, but is it not better to have a cow giving her quantity in, say, ten months, and being done with it, than to have her stripping on for another month or five weeks, giving only a quart or two and counting as one to be milked all the same? Strange as it may seem, I am certain a cow will give more milk in a series of years, milking ten months and going dry two each year, than if milked on continuously, or nearly so. As a rule, I find that the cows giving the best records go a reasonable time dry—from six to nine weeks generally—and if I lived up to my belief should set every cow dry at least six to eight weeks before her reckoned time of calving. Again, as to the time of calving: Under ordinary treatment, a heifer will, I think, milk best calving on the flush of the grass, but very much depends on the quality of the grass or on the treatment and feeding given to her if she calves at another time of the year. As a matter of fact, a well-fed heifer calving in March has about the best chance to milk well, always provided she has been so fed as to set her udder thoroughly, because just when she is beginning to fall off in milk, a little fresh grass may be expected to spring her again, and prolong her full milking period.

Of course, the same thing holds good with a cow, although in both cases it is very largely a matter of feeding. Many of my best cows have been autumn-calving heifers, and, as a matter of fact, I prefer autumn-calving heifers for making good milkers. Possibly it may be because my winter feeding for the milkers is somewhat liberal, and for the heifers (kept, as they must be at an off farm, mainly on hay) not calculated to set an udder as it should be, but nearly always the autumn calvers come in with far better shows than the spring or early summer ones. This only bears out the remark about the necessity of having

a heifer's udder well filled and hard before calving. It is, however, quite possible to overfeed a heifer before calving, and the winter feed required to set her udder is liable to unduly fatten her body: and while a fat heifer will often calve with a splendid show, she rarely milks as well as one with a good show, but only in good condition herself, and not fat. For this reason I rather fancy autumn calvers; the summer's grass has a tendency to fill the udder more than to fatten animal—at least the second-rate grass that most heifers have to be content with has this effect, I think. When the heifer is once calved, it is difficult to over-feed her, but she must be well milked, and every time, her milker must get every drop possible, and then, like *Oliver Twist*, unblushingly ask for more. Even a moderate heifer so treated will develop into a fair cow, while the best possible heifer, if badly milked, will turn out a poor cow. Such is my experience at least.

The Poultry-Yard.

FATTENING CHICKENS No. 2.

To the Editor of the JOURNAL OF AGRICULTURE:

In my last notes on fattening chickens there were some few details I omitted. One is that young cocks make the most gain, pullets do not seem to fatten so well; (1) another idea is that the young pullets make good layers for the winter.

The gains per week for the 200 chicks were as follows: first week 173½ lbs, 2nd week 19 lbs, 3rd week 26½ lbs, 4th week, being the first week of stuffing 140½ lbs, 5th and 2nd week of stuffing (2) 103 lbs, the last 6 days they made a gain of 80½, a total of 547 lbs, an average gain of 2¾ lbs for each head. The reason why there was very little gain during the 2nd and 3rd weeks was that the ground feed was not ground fine enough, and the chicks took sick, some of them even died, the first week of ordinary feeding, and the last 3 weeks of stuffing they did very well.

At the experiment made at Carleton Place, Ont.,

(1) Curiously enough, our experience is just the reverse, and we have fattened many a score of both. If cockerels fattened more easily than pullets, why make capons? Ed.

(2) In England we use the word "cramming." Ed.

there were only 133 chicks, they weighed more than those at Bondville, Que., but they did not gain quite so much, only 2½ lbs on an average : first week the gain was 57 lbs, 2nd 74, 3rd 127, 4th 12, 5th 13, 6th 58 lbs. The chickens were sent, one lot to Liverpool, and the other to London. Those sent to Liverpool sold on arrival at 16 cents per lb. wholesale ; this should at least net 10 cts, or over, here. The chicks were bought at 6 cents per lb. and the cost of feeding was about equal to 6 cents a lb. gain ; by the fattening process and killing according to the wants of the consumer, a gain of 4 cents per lb. was made. In order to get the best results the chicks must be between 4 and 5 months at the beginning of the fattening period. A small experiment was also tried, at the Experimental Farm, Ottawa, with 36 chickens, some of these which were about 6 months old. The gain was less than 2 lbs, for the simple reason they were in good condition when the feeding started, far more so than the common chicks as raised by the ordinary farmer. They were not stuffed, only fed in the ordinary way. They were very large, almost like turkeys some of them weighing over 9 lbs. Had they been stuffed and made as much gain as the same breeds did at Bondville, there would have been a good percentage of them gone over 10 lbs.

There is no use in sending chicks to the English markets without specially fattening them before hand, as ordinary fowls are not wanted, only the best. Englishmen, as a rule, want the best of everything, they do not want any shoddy, the best is none too good for a Britisher, he has the money to buy the best, anything under finest will not sell for enough to pay cost, while the best is sure to give a good margin of profit. One firm in Montreal had a contract of 80,000 turkeys, this year, for an English firm, and the most of these were brought in Ontario, more than 75 per cent of them had to come from thence. Another year, the farmers of this province can increase the receipts from the dairy factories by fattening turkeys and chickens, and the money got by this means comes at a time when the receipts are not otherwise very large. Now is the time to go in, do not wait for a few years to see how your neighbor is going to succeed ; there is money now, later there may not be such a margin. I would strongly advise farmers to sell all their grain through animals of some kind, such as the cow, pig or the hen ; these 3 animals make

a strong combination ; but it requires skill, skill of no ordinary degree, care and patience. Hens to lay eggs in winter should have a warm place, plenty of sunlight ; they must also be young and healthy ; pullets lay much better than old hens ; fed regularly, of the right sort, not too many in one place, small gravel, or broken dishes when needed, lime and ground bones 2 or 3 times a week, some dry ashes for a dust bath ; having these there is no reason why the right kind of hens should not lay plenty of eggs during the winter months, when they are worth something. This is perhaps not just in my text, but still not out of place, I hope.

Yours,

PETER MACFARLANE.

Chateauguay,
30th, December 1898.

DOES DOCTORING PAY?

With the increasing number of hen's diseases and the many new publications brought before the public concerning their treatments, it becomes to a certain extent a matter of speculation whether it really pays to doctor a sick fowl. If a few fancy and valuable specimens are kept for amusement with the idea of enjoying their appearance about the premises, or perhaps with the hope of winning prizes in the prominent shows, it may be worth one's while to study an ailment and follow its course into a disease, or treat it for a possible cure. Some people have a fancy for this experimenting with animals, and it is often, after all, only an experiment.

The successes are limited and the fatalities large. To what end is it actually necessary to dose a fowl with medicines ? She will seldom if ever regain perfect health and will be a confirmed invalid as far as her breeding and laying qualities are concerned. Strong, vigorous, healthy specimens are the ever sought for and seldom found desideratum. Among the large breeders the ax is the considered the panacea of all hen diseases. We must not however, confuse ailments with diseases. Fowls have slight attacks of various forms of diseases which a little watchfulness and care at the start may entirely eliminate from the flock.

Successful poultry raisers spend much time in trying to prevent disease ; attention to details,

constant watchfulness and careful feeding play the most important part in the every day life of the prominent breeder. So much time is given therefore to prevention that it is considered a waste of time to doctor when disease appears. Let us look closely into the list of so called diseases. A few years ago an ailing bird was supposed to have the pip. In fact it became a by word when I was a boy that all sick fowls had the pip. Chickens were afflicted generally with pip or gapes and either was considered hopeless. Roup and cholera the two worst scourges of the poultry yard were scarcely known. To-day we have so many diseases exclusively belonging to the poultry yard that one is led to believe that if a man were to read the whole list before starting into the business of raising poultry he would certainly change his mind and take up something else. Perhaps it is a fortunate thing that as a rule this list is not usually read by the beginner until he gets well started in pursuit of his object of raising hens. With the exception of roup and cholera, two-thirds of all the hens troubles come from over feeding, of course there are local ailments which are erroneously called diseases, such as bumblefoot, scaly legs, etc., etc. It is therefore more important that the farmer or amateur should turn his attention to prevention before commencing treating diseases. It is at this very time of year that the trouble begins. After seeing that your houses are put in perfect order, by which I mean limewashed, thoroughly cleaned, roofs tight and everything in such shape that your fowls can be housed free from vermin and draughts. You must look to care and feeding. Ventilation is a most important consideration. I do not believe in the so-called ventilators of any kinds, the small slides at upper ends of buildings, the top ventilation, by building an excrescence on the roof with slides inside to be opened or shut, and the pipe reaching to within six inches of the floor, all do more harm than good and cause a great percentage of sickness, starting with colds in the head. Night, when fowls are roosting, is the time most dreaded by poultry men. Then it is that the house should be tight in every sense of the word. Some even go so far as to have enclosed roosts and curtains in front to be let down in extreme weather. This is not a bad idea, but sometimes frost will form aided by the heat of the fowl and this will cause dampness. When the morning comes the windows should all be

opened, especially if the air is dry, no matter how the thermometer may be. This is true ventilation and of the very best kind. The fresh air will dry out the house and the foul odors will escape. The hens being kept constantly busy as they should be will not feel the keen air too much. If the sun shines, even though it may not be so warm as in the early spring months it will put new life into them, and they will thrive amazingly. After night feeding, close everything up tight again before the evening chill comes on. This mode of ventilation will in a great measure ward off symptoms of roup, cleanliness comes next.

Every day the dropping boards should be raked off and fresh land plaster, coal ashes sifted, sand or land, or air slaked lime sprinkled over them. Ventilation would be of little use if filth is allowed to accumulate. Extreme care in feeding is probably the most important consideration. Water constantly withing reach is not quite so necessary in winter as in summer. Many of the most prominent breeders give it hot in the morning. The feed of the morning should be a warm mash of a variety of ingredients to supply as nearly as possible their natural wants, but care should be taken not to feed the heavy birds too hearty a meal, else they will get lazy and indolent and soon become over-fed, thus paving the way for a sequence of diseases.

Green vegetables of all available kinds, sound grain, with plenty of shells and sharp grit, constitute about all the requirements of our feathered friends. Last but by no means the least factor in keeping the fowls in good health is exercise, constant exercise from morning until roosting time is absolutely necessary. If you can so regulate your daily work that you can keep your flock in dry, clean houses free from lice, fed judiciously and compelling to exercise for all they eat, you need not trouble yourself very much about disease, but if it comes treat if you will symptoms and ailments, but do not waste time trying to bring back to life a doomed fowl.

S. J. ANDRES.

FEED AND ITS PRODUCTS.

All farmers feed corn and wheat to fowls that are to be fattened for market. It is well understood that in order to make fat on a carcass the use of what are called "carbonaceous" foods must be used. For laying hens the food is nitrogenous;

that is, it contains more of the albuminous material. For instance meat, skim milk, the white of eggs and the gluten of wheat are nitrogenous. Fat, starch and sugar are carbonaceous. By keeping these facts in view the subject will be better understood. The supposition that corn is the best material for fattening fowls in confinement or otherwise is not borne out by investigation. The edible portions of a fowl (taking the average of analysis) consists of about twenty-four and one half per cent of the nitrogenous elements and only two per cent of fat. Of course there are other portions of a fowl that are not edible and in which there is more fat, but enough is known to affirm that in order to secure the largest increase in weight, when a fowl is being fattened for market, a fowl must have a ration containing more of the nitrogenous materials than is found in grain, corn containing about eleven per cent and wheat containing twelve per cent of nitrogenous matter. Young fowls that are growing will increase more rapidly than the adults, hence corn will give better results with fowls than with chicks; but there is a great advantage in a mixed ration, whether the fowl is old or young. Eggs are more nearly balanced than the flesh of the fowl in nitrogenous and carbonaceous substances, as an egg contains about fifteen per cent of the (nitrogenous classed as "protein") to ten and one half of the carbonaceous. Then, there is the mineral matter, (bone etc.) of which one and one half per cent is found in the edible portion of the fowl and about eight-tenths of one per cent in the edible portion of the egg. Hence, the food must be of the proper constituents to supply the wants of the fowl for its well being under all conditions. Again, much carbonaceous matter is used by the fowl to supply bodily warmth in winter. Grain is consumed really like fuel, the body of the bird being the store, and heat created. If grain is largely fed in the summer, the fowl will not require it, because it does not need heat at that season. It is easily seen, therefore, that corn and wheat may be excellent foods when the weather is cold, but very injurious in summer, an excess of grain resulting in the storage of the surplus heat on the body in a latent form, and which is known to become fat. Corn is cheap only when it is needed. When it is not required, it becomes very expensive. If nothing but corn is given as food to fowls they may starve in the midst of plenty. They die because they have an oversupply of the carbonaceous material

and not enough of the nitrogenous. They cannot supply the waste of bone and tissue, yet their bodies may be weighted with fat. They become debilitated, weak, their legs fail and disease takes them off. In addition to the grain, therefore, other foods should be used, such as cut-clover, bran, cut bone, meat, linseed meal, blood animal meat, cabbage, potatoes, skim-milk or any other kind of food, but do not confine the fowl to a strictly grain diet. Give laying hens a ration about equally balanced in the nitrogenous and carbonaceous substances as food, and the same for growing fowls. When fattening adult fowls add linseed meal and meat to the grain ration, as the carcass, though complete, may only require more fat; but never feed a ration to any class of fowls if the food does not contain in some degree nitrogenous material, as corn and wheat exclusively will not give the best results.

AGRICULTURAL AND NEWS COMMENTS

Milk is pasteurized when it is heated from 155 degrees to 167 degrees. This process kills most of the germs. Boiling the milk (212 degrees) or heating it nearly to boiling point kills all the germs and is called sterilization.

A good way to start a forest of nut trees is to plant the seed in the ground where the tree is to grow. Samuel Miller says: "Cover the walnut two inches, hickory one, acorn one, hazel nuts and chestnuts the same as hickory."

A common estimate of the cost of eggs is one cent each. This is a fair estimate, allowing the average cost of a hen to be \$1.25 a year, supposing that she lays about ten dozen eggs in that time. But the hen above the average will lay more eggs and therefore produce them at less cost each.

Pigs may be made useful in more ways than one. Recently an Australian coasting steamer struck on a reef and those on board were likely to come to grief. There being no rockets on the ship, the captain tied a life line to some pigs which formed part of the cargo, and had all the animals put overboard. The pigs swam to the shore taking the lines with them, and by establishing communication every soul on board was rescued by means of travelling cages.—*Farming*