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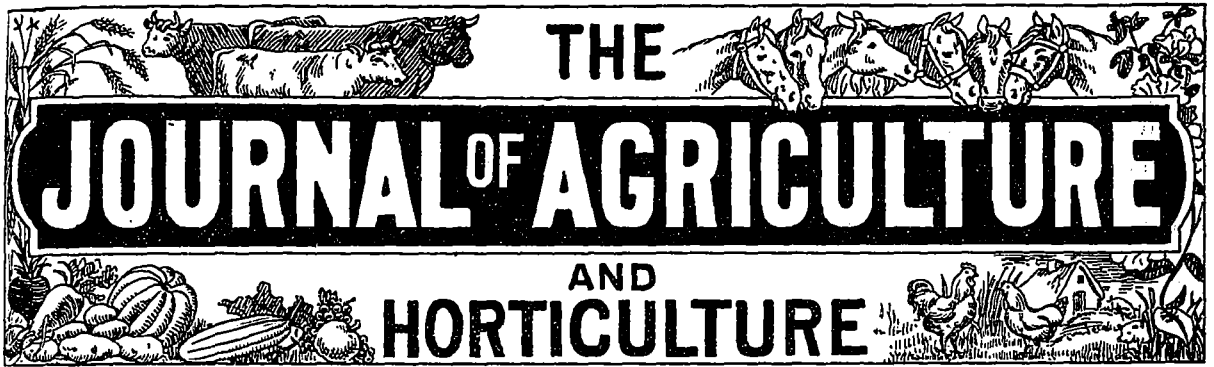
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This Journal replaces the former "Journal of Agriculture," and is delivered free to all members of Farmers' Clubs.

JULY 1, 1898

.. THE ..

Journal of Agriculture and Horticulture

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COMPETITION OF AGRICULTURAL MERIT, 1897.

VISITS TO THE FARMS

No S. M. DÉSIRÉ BÉGIN.

On September 30th, we visited the farm of M. Bégin, at N. D. du Sacré-Cœur of Rimouski ; it contains 150 arpents, 135 of which are in cultivation. An arpent and a-half of orchard is in full bearing in spite of the rather severe climate of Rimouski.

No system of rotation, properly so called, is followed here. Most of M. Bégin's meadows are river-bottoms, alluvial soil, covered at different times by a thin coat of manure and broken up often enough to prevent the soil from getting too sour.

His other lands are well farmed, with plenty of hood-crops.

Had the buildings been in better order and more handy, and were the accounts well kept, we should have felt bound to put M. Bégin in the first class, for we think him by far the best farmer we saw this year.

And we must not pass over the fact that he has carted from his own land and from elsewhere, more than 10,000 loads of stones, with which he has conduited about 125 arpents of drains (750 yards) which work famously, as well as made several other permanent improvements.

The cattle are a good sort for the dairy ; we allowed for them 11.50 out of 15 marks.

M. Bégin keeps one head of horned cattle to every 3 arpents, which is pretty fair in such a climate, with his long rigorous winters.

Among the crops are 2¼ arpents of very fine

rape, of which plant M. Bégín speaks very highly.

We would say more, were it not that the table of marks speaks for itself, and we therefore rest contented with the expression of our satisfaction at seeing such good work so perseveringly carried on. It is a very good example for a family. (*parish?*)

M. Bégín is allowed 87.55 marks, which entitles him to a silver medal and a diploma of very great merit, and to our sincere congratulations.

No 9. Mr. SAMUEL EDWARDS.

Mr. Edwards farm consists of 125 arpents under the plough, 10 in permanent pasture, and 65 in bush : 200 in all, with a nice orchard.

Rotation : 1st year, oats or maslin ; 2nd, hoed-crops and pease ; 3rd, barley or wheat with clover and timothy.

Three or four years in meadow, and then pastured.

We allowed full marks for this, as Mr. Edwards takes the greatest care of his manure, and his farm, moreover, is very free from weeds.

Mr. Edwards is a most industrious man. His constant activity has enabled him to clean up his farm which in some parts was literally covered with stones, all of which he has used for drains and fences.

We reckon that he has carted off 14,000, loads of stones, making 40 arpents of generally well built walls with them, and drains in several places. The drains are so laid down as to form drinking-pools for cattle in several of the fields.

Management good. Suitable buildings and well kept up.

We refer the reader to the table of marks for the rest, except that we may observe that the owner of this farm is a man to whom time is money. Very poor when he began, Mr. Edwards is now at ease, surrounded with a fine family that if they follow their father's example must turn out well.

Mr. Edwards wins 87.15 marks, and thereby can claim a silver medal and a diploma of very great merit.

Notes by the Way.

Food and milk.—We have often spoken in this periodical on this, as yet unsettled, question : can milk be made richer by feeding the cow that yields

it on richer food ? Not six weeks ago, the "British Dairy-farmers' Association" had their annual outing at which it is the custom, after each day's work of inspecting dairy-farms and herds in different counties, to listen to lectures, given by men of theoretical as well as practical attainments in dairying, and after the lectures, discussion are held, and opinions are—as usual in England—*very freely* given on the subjects discussed.

At the meeting in question, held this year in the County of Cornwall, Mr. Lloyd took as his subject the dispute among dairymen mentioned by us at the beginning of this article. Has he any authority to speak on this point ? Why, as he is the chemist of the Association, he may be supposed to have some notion of the action of food on the product of the cow that eats it ; besides, he is widely known as one of the most thoroughly practical of the chemists who have devoted their talents to the cause of agriculture.

And he is pretty positive in his statements, too, is Mr. Lloyd, as, being of Keltic extraction, he is bound to be. He has no doubt about the matter. The prevailing opinion among experts appears to be that the quantity of milk and butter yielded by a cow is affected by her food, but that the ratio of butter to milk is hardly at all affected by any change in diet. We prefer Mr. Lloyd's, summing up of the arguments : when properly fed a cow will neither gain nor lose in live weight, and will produce the maximum quantity of milk her physical conformation permits, that milk being of its maximum quality. If an excess of nutriment be given, the tendency to fatten will gradually outstrip the tendency to milk production ; if too little nutriment be supplied, the body will suffer first, than the quality of the milk, and *lastly the quality*. Change the food, and a change in quantity and quality will be evident in the milk ; but it will not be immediate, and so the results of experiments are often misleading, because they are commonly carried out for too short periods.

Mr. Lloyd, holding our opinion, the opinion of every dairy-farmer we ever met with, carried on an experiment of keeping cows on pastures of different character, and the milk varied in both quantity and quality according to the pastures upon which the animals were feeding. Nothing that he has yet heard can shake his conviction that food has a marked effect on the *quality* as well as the quantity of milk.

Mr. Nuttall, one of the largest cow-feeders in the

London suburbs, "found that the quality of milk that he bought varied greatly. When he complained, the farmer said that he would try a little cake, and he nearly always found an *improvement in quality* as the result of better feeding."

Mr. Holman, a Cornish farmer, said: "Here, in Cornwall, we find that when cows are well fed the cream is rich, and when poorly fed, the cream is poor. We find a great difference in the proportion of cream in accordance with the pastures the cows are feeding on. Nothing was more common than when a farmer's wife found the milk falling off in *quality* for her to ask her husband what pasture the cows were in."

The Dairy.

AMERICAN CHEESE.

Last month we copied the complimentary notice on "American" cheese of the Cheddar style, over which *Howard's Dairyman* smacked his lips so appreciatively. Below will be found a much more reliable write-up of the "geniwine" American product, that *Howard* may contrast at leisure with the honest Canadian Cheddar which the English grocer correctly said is knocking out the native product, even in the village of Cheddar itself. We quote from the *Breeders' Gazette*:

"It seems impossible to compel some manufacturers of imitation dairy goods to be honest. Laws have been enacted calculated to secure the sale of bogus butter and cheese under their proper names, but some manufacturers of these imitation products seem determined at all hazards to sell them as genuine, thereby reaping a larger profit. So persistent is the swindle that patience is severely taxed, and it may not be a far step to the prohibition of the manufacture of these substitutes for standard food products. If their manufacturers cannot be made honest by law it is possible that an outraged public will compel them to shut up their shops.

"Now it is filled cheese. Mr. W. A. McKnight, a member of the Liverpool and Manchester Chambers of Commerce and a large importer of American cheese, has recently brought from England evidence conclusively showing that fraud has been successfully practised through the maladministration of the law governing the exportation of filled cheese. The law requires that packages

containing filled cheese for home consumption or for exportation be plainly marked "Filled Cheese," with "two-inch black-faced letters." This serves as a notice to purchasers that they are buying imitation goods. Since the law has been in force American manufacturers of filled cheese have made a show of complying with it, but in reality they have failed to meet the plain requirements of the law, owing to the carelessness or indifference of the Internal Revenue Department. The result is that such frauds have been practised that the consumers of American cheese in Great Britain are disgusted with the imported cheese, and thus what has been a profitable market to honest American cheesemakers is dangerously near being lost. If, under the law, packages containing filled cheese were stamped with two-inch black-faced letters, fraud could hardly be practised, but some American exporters have cunningly placed a surplus wrapper round the cheese marked in skeleton letters which are scarcely decipherable and even this surplus wrapper is removed when the cheese is received in Great Britain, thus leaving the imitation article in a condition to be palmed off as pure American cheese. The health officer of Manchester has reported a case of poisoning by cheese with fatal results, and the authorities seized the consignment and are having a chemical examination made by Prof. Delepine, of Owen College. The *Manchester Guardian* of May 6, and the *Chester Chronicle* printed an account of the fraud mentioned, and one of them concludes that "the importation of the imitation cheese by the fraudulent practices herein complained of will certainly lead to shutting out not only imitation cheese, but pure American cheese, as there is practically no way under the law as at present administered to distinguish the base cheese from the pure."

ALBUMINOIDS FOR BUTTER.

The first part of the Annual Report of the Storrs Experiment Station for the year 1897 has lately been issued. This contains two articles of very considerable interest to the farmer and dairyman. The first article gives the results of a large number of experiments upon rations fed to milch cows. The relative economy of different kinds of rations as regards the quantity and quality of the milk production is discussed at some length and, among others, the following conclusions are reached: In forty-five feeding tests made upon private herds in

different parts of Connecticut, it was found that the use of liberal proportions of nitrogenous fodders and grain feeds such as rowen hay, clovers, oats and peas, cotton-seed and linseed meal and gluten feeds, tended to lessen the cost of the ration in the majority of cases while tending to improve the *quality* and quantity of the milk. By growing a larger amount of the leguminous fodders, such as clovers, peas, soy beans, etc., the quantities of concentrated grain feed purchased can be lessened, and the better grades of hay which are expensive for stock feeding can be sold.

In the second article of the report, the question of nitrogenous feeds is still further discussed, and the composition and digestibility of different kinds of feeding stuffs is shown. Results of experiments in other experiment stations are given and their bearing upon the feeding of milch cows discussed. It is urged that cows of the same live weight may differ greatly in their food requirements. The cow giving 15 quarts of milk per day requires more food than one of the same weight giving but 8 quarts of milk per day. Profitable feeding must take into account the cost of the food, the value of the product and the quantity and *quality* of this product. While there is no "best ration" that will fit all animals and circumstances, it is practicable to suggest certain rations that may aid the dairyman to increase the milk-yield of his herd or diminish the cost of the feed. A number of sample rations are given in the report. Sent free on application to

STORRS EXPERIMENT STATION,
Storrs, Conn.

The master point in this matter of food management then is to produce the best and cheapest roughage food we can, and so prepare it that there shall be the least waste, and retain to the greatest degree the natural juices or succulence. The value of this juicy or succulent state in roughage food can be seen by any man. A good cow will do her best producing, say, a pound or more of butter a day on fresh June grass, at the 2½ inch length. Every farmer knows this.

It has been found that a one-thousand-pound cow will eat about 80 pounds a day of this grass. On this she will keep up her milk flow and butter yield. Dry 80 pounds of that grass and you will have from 16 to 20 pounds, depending on its age. Feed the cow that dried grass, giving her all the

water she will drink, and she will soon shrink her milk and butter yield. This convince me of the real practical value of succulence in roughage, and when I see how farmers let their grass stand till it is too ripe and woody before cutting it for hay, and feed dry, over-ripe corn stalks, evidently paying but little attention to succulence, I am compelled to believe they do not understand its value. Ex.

DAIRYING IN CANADA.

I.

It is almost impossible for any one person to do justice to so wide a subject as Dairying in Canada. The distances are so enormous (at least to an English person), and the different provinces so large and far apart that it would not only require weeks but months to visit all the interesting farming centres in each, but by continuous travelling and the kind help and guidance which I have received throughout the country from the dairy commissioners, the superintendents of the different stations and departments, and from representatives of the different governments, agricultural colleges and societies, I think I can venture to give my English friends some idea of the methods practised in this bright and beautiful country. The first thing that strikes one is the varied nature of the scenery in one province. I travelled 1,200 miles without stopping, surrounded by wild rocky scenery, with hundreds of beautiful little lakes, and no sign of habitation visible. Then there is the flat prairie land with its golden covering of grain; the districts where good grass land abounds, well-sheltered and watered, and very English in appearance, with here and there luxuriant fields of corn (maize), 6 and 8 feet (to 14), high, tobacco, beets, and other crops, and we must not forget the district where peaches, grapes, and almost all fruits are grown in abundance. I think a peach orchard is one of the prettiest sights of the country. Next to the varied resources of the country, one is surprised to find such a charming people. Our English ideas of colonial life are somewhat crude, and it is quite a delightful surprise to find everything so totally different to one's expectations. The houses in the cities are really models of convenience and comfort, and the farm houses are prettily built, with every convenience, and are as a rule extremely clean and well kept.

The farmers are intelligent and intellectual as a class, and show an anxiety to excel in everything when once they see the way, and they are honest and industrious, and fully recognise the importance of having and maintaining a good reputation for themselves. Thus country people of all nationalities are to be found, but they all work together with a willingness which is truly admirable in furthering any object which will add to the prosperity of the nation. In fact they are all interested in the one great question of "How to farm the land to the best advantage, and how to obtain the best prices for its production." Everything is more or less dependant on agriculture, and in these days of rapid development and great competition it is no wonder that a country so purely agricultural as Canada should aim at placing dairy and other produce of such a superior quality not only on the one best market for the whole universe, but on all possible others, as to merit the highest awards for their general excellence, and all forces have been mustered to accomplish this as quickly as possible. The Dominion and provincial governments, the agricultural colleges, the railway companies, and the steamship companies are all working in combination with the farmers towards the same end, and that is to produce cheese and butter, fruits, and meat; butter especially in larger quantities than at present, of a quality which cannot be surpassed, and to put these products on the markets at a price which will make competition from other countries almost impossible. Whether this can be done remains to be seen, but the Dominion and provincial governments, with the dairy associations, have such a splendid system of co-operation with the farmers in establishing creameries and cheese factories, and in educating managers for them, and the interests of the two are so thoroughly united that the most beneficial results must follow.

In the provinces of Quebec and Ontario dairying has been practised from the days of the earliest settler, but in the Far West, Manitoba for instance, it is only recently that the farmers have come to the conclusion that anything but wheat can be produced, and, although thousands of acres of golden grain about harvest-time form a beautiful picture, it is too treacherous a crop to be relied on entirely, and so now mixed farming is being gradually introduced, and the Dominion Government have laid down creameries both in Manitoba and the North-West Territories, and others have

been started from different sources, so that dairying is largely on the increase in the West, and winter dairying in all the provinces. Originally, cows were only milked long enough each season to support the cheese factories, but now farmers are improving their breed of cows, are building siloes, are growing larger crops of suitable winter fodder, and they find it more profitable in many ways. The principal advantage is that the factory can be kept going all the year, but is converted into a creamery during the winter months. Canada considers England her best market. British Columbia has been a very good market of late owing to the prosperous times of the mining population, and if only a road can be opened up to the Klondyke, and it turns out to be as good as many people would like to believe at present, it is impossible to calculate the fortunes in store for Canada. One shipment of 10,000 lb. of butter in 2-lb. tins has been made, and realised 5s. per lb., but how much must be deducted for freights I could not find out.

A few years ago there was a very small quantity of butter exported, from the fact that the quality was not good enough for the export trade, the result being the local markets were often overstocked, and it was no encouragement to the farmer to produce milk for butter-making. There was great need for something to be done for the development of the dairy industry in this direction, and there was some agitation on the subject about 1889, which resulted in the assembly at Ottawa of delegates from the existing dairymen's Associations in the several provinces, and, by the courtesy of the Speaker of the House of Commons, the meetings were held in one of the committee rooms, and, after much discussion, a resolution was adopted in favour of the organisation of a "Dairyman's Association for the Dominion," the aim of the Association to be to foster and promote the general dairy interests of the Dominion of Canada. The Association was in due course formed and officers selected. Several conventions were held, and in a short time the Association was accorded the privilege of laying its views before the House of Commons Committee on Agriculture, at one of its Sessions, and at that meeting several members expressed themselves as being entirely in sympathy with the movement by deciding, in the first place, to advise the appointment of a dairy commissioner to carry out the objects of the Association. The appointment

took place in 1890, and the work commenced at once. Conventions were held in each province; one of the most noted was one held at Ottawa, when Lord Stanley, then Governor-General, was present, and took part in the discussions, which were so interesting that a full report of the proceedings was published, and 50,000 copies were sent to the farmers. The object of these conventions was to get the farmers together and to discuss the advisability of forming in each district dairy associations such as had been formed in Ontario years before, and had done much to improve the quality of cheese by the formation of factories and engaging skilled instructors. The Association was strengthened by a grant from the Dominion Government, and 6,500 dols. were expended in 1889, and the immediate return in the province was calculated at 475,000 dols. in cash more than would have been realised had the instruction not been given. These facts being brought before farmers of other districts resulted in the desired associations being formed, and also brought before them the importance of establishing some definite system of management, whereby they might derive the greatest benefit from the advantages offered by the Government, who practically offered to make it their business through their Commissioners, to arrange for the production and marketing of agricultural produce, to be carried out on the very best principles, and it has, in the short period of seven years, not only improved the quality of Canadian produce, but increased the output by nearly eight and one quarter million dollars.

E. A. MAIDMENT.

A WORD FOR THE SHORTHORN COW.

SCALE OF DAIRY POINTS IN CHAMPIONSHIP AWARDS.

As a rule the ordinary Shorthorn cow can take care of her own rights all over the country, in any company, but just now I think she needs the consideration of the Council of the British Dairy Farmers' Association.

I maintain, and I am sure English tenant-farmers will agree that, broadly speaking, the ordinary Shorthorn cow is the best "all round" dairy cow for English climate and conditions.

I read that the adoption of the following standard of different breeds in adjudicating champion

prizes in the milking trials at the London Dairy Show is to be considered at the next meeting of the Council of the B.D.F.A. :

Breed.	Points.
Shorthorn	120
Jerseys Cows	90
Jerseys Heifers	55
Guernseys	90
Ayrshires	100
Kerries	70
Red Polls	90
Cross-breeds	120

I take it that the cow of any breed getting the greatest excess of points over her breed number wins the championship. Now to see how this new idea will work, let us take the experience of the last eight years (omitting 1891, when there were no milking trials.) I find that judging on this scale the championship would have been won by :

Jerseys	Twice.
Guernseys	Twice.
Red Polls	Twice.
Ayrshire	Once.
Cross-breeds	Once.

The championship would, therefore, on this scale of points, never have been won by a Shorthorn—the *par excellence* dairy cow of England—during the last eight years. Is it a fact that there has never been a good Shorthorn cow exhibited in this time? or is it that this is not a fair scale of points? I incline very strongly to the latter idea.

If, luckily, I was a wealthy landowner, I should probably have a park round my mansion, a dairy fitted with tessellated tiles, a pretty dairymaid, and, possibly, a herd of Jersey or Guernsey cows to adorn my park, and supply me (as I admit they will) with first-class butter.

But being a tenant farmer, I prefer to keep a herd of fifty or sixty Shorthorn cows, believing that they are the best general purpose cow to pay my rent. They will milk, breed valuable stock, and feed.

It is because I believe that the Council of the B.D.F.A. aim at the general improvement of the dairy industry of Great Britain rather than the fostering of a fancy breed that I bring this question forward. They desire, I believe, to help the dairy tenant farmers of England.

The Shorthorn cow is the foundation of the

dairy farmer. I hope she may again be given the chance to win the "Derby" of the dairy, as in the old system she has won it—and rightly so—four years out of eight.

JOHN EVENS,
Burton, Lincoln.

TURNIPY MILK.

Whenever turnips are fed to milch cows it is almost impossible to get rid of the turnipy odor in the milk. This objectionable odor causes considerable loss to our cheese industry in the fall, and to our butter trade in the winter. In the butter factory the only way to overcome the trouble is by Pasteurizing the cream. Various methods are advanced as being successful in doing away with this odor, but all are not successful. The following are some of them :

(1) The objectionable taste comes from the crown of the turnip. If this is cut off and thrown away entire, the remainder will not affect the milk. These tops can be fed to young stock or other stock not milking.

(2) Dissolve a teaspoonful of carbonate of soda in a teacupful of warm water, and add this to six gallons of milk when first set in the pans. For a single gallon, of course, one-sixth of the above would be sufficient, and for two or three gallons in due proportion. The turnips ought to be given to the cow immediately after milking.

(3) Pulp or crush the turnips so fine as to make them quickly and easily digest after eating, and when fed mix with cut hay or straw. A good plan is to pulp the turnips twelve hours ahead and let them stand. The volatile odors seem to pass off, and there is less trouble from them. Mixing with other feed and allowing the mixture to stand from one feed to another has somewhat the same effect.

(4) Scald the milk as soon as drawn from the cows. The best way to do this is to insert the milk can into a large pan or kettle about three-quarters full of boiling water, and stir the milk until it reaches 80° to 90° of heat, and then set it away to gradually cool off. The cream then rises thick, come off in a lump, and is churned quickly. All the above remedies are so simple as to be easily tried, and if they do no good, cannot effect harm.

THE EFFECT OF FOOD ON MILK.

I cannot agree with Mr Primrose McConnell with respect to the absence of influence of food on the quality of milk. Mr. McConnell says that "the food affects the quantity only, and the proportion of total solids therein." On the other hand, Mr. Lloyd says: "I, a scientific man, agree with practice, and have yet to find evidence which can shake my conviction that food has a marked effect on both the quantity and quality of milk." To me, who have for half a century been occupied with dairy cows, the milk of which has been used for the making of cheese, of butter, for rearing calves, and for the sale of new milk, it appears absolutely certain that food affects the quality of milk. It seems to me quite impossible that I have been wrong in attributing variations in the amount and in the quality of cheese and butter from given quantities of milk to the influence of the food which the cows were eating. Also, it seems to me impossible that I have been wrong in attributing the thrift, or want of thrift, of my calves and lambs to the effect of the food which their mothers have been eating.

I am no chemist, but I am sorry, on behalf of chemistry, if Mr. McConnell is right in his description of the contradiction between fact and theory, which he gives on p. 662, under the head of food. He says that "we now depend on analysis alone . . . that in the amount of butter which can be recovered from a given quantity of milk, there may be a variation of as much as 50 per cent., depending on the nature of the food given, while all the while the analysis of two differing milks may be approximately alike." But farmers, if the above is a correct statement, would immediately take sides in favour of having 50 per cent. more butter from the same quantity of milk, and would leave analysis in the chemists' laboratory. I should be sorry to be placed in such a dilemma, and should prefer to maintain the position with which I am at present satisfied of looking upon chemistry as an excellent servant, but a bad master.

Mr. McConnell quotes Professor Henry with approval, when he says: "If the milk of the dam were subject to marked or violent fluctuations, varying in composition with every small change in quality or quantity of foods supplied, the welfare of the young animals receiving it would be cons-

tantly threatened." It would be quite easy to fill a long paper with illustrations of fact as to the way in which the welfare of young animals has been affected by the food eaten by their mothers. Several of my own children had, when young, the milk of a cow instead of the milk of their own mother. It was absolutely necessary not to change the cow, and to be careful in her feeding. Change in the quality of the cow's milk, quite irrespective of the cow's health, immediately caused disorganisation. A few weeks ago a neighbouring farmer came to me and asked my advice with respect to a young foal which was suffering from scour. On inquiry I found that the mare had, with her foal, been put into an orchard, in which the grass was rank. My neighbour seemed to be at once convinced that I had suggested the right cause. He acted accordingly, and changed the mare's food in time to save the foal's life. Everyone who has experience in the feeding of young calves or lambs knows quite well that the influence of food on the milk of the mothers of the calves and lambs is not only great but quick in action. A couple of months ago I had a full supply of mangels, and my dairy cows were fed liberally with them, but I did not allow two cows whose milk was used for suckling young calves to have any.

The calves would inevitably have suffered from diarrhoea if they had been fed with milk given by cows liberally fed with mangels. I cannot in this instance give the analytical composition of the milk of mangel-fed cows, but the reports made of my milk at other periods by skilled analysts is in accord with my own experience. And my own experience tells me that milk produced either by the tops or the bottoms of mangels is poor in yield whether made into butter or into cheese. Also my own experience tells me pretty much the same tale as that quoted by Mr. McConnell about the variation of yield of butter from similar quantities of milk under variations of feeding. Ought we to regard the teaching of such chemistry which affirms that the "analysis of the milk is not influenced at all, or only to a slight degree, or temporarily." If this be a correct statement, are not dairy farmers justified in founding their practice on results and not upon theory? Perhaps Mr. McConnell will give as his reply: "All the worse for the facts." That reply has been given before.

T. C. S.

WHAT'S IN A NAME.

Under this heading, Hoard's Dairyman gets off a rich column of comment on the British taste for "American" cheese. He says:—

We have clipped, and publish below, a couple of items from the Farming World of Edinburgh, which serve to show in what esteem American cheese, and American methods of cheese making are held across the water. Here is the first one:

GENUINE CHEDDAR.

We heard a curious little story in this decayed village of Cheddar. It is said that early one morning, about four years ago, a "four-in-hand," loaded with editors, professors, champion cheese makers, "experts," and the like, from North Britain, drove into Cheddar and expressed an eager desire to obtain some specimens of "genuine Cheddar," and get away again. "Ah," said the man, heaving a long drawn sigh, which almost amounted to a groan, "I have often wondered how the chaps got on with their souvenirs." It was only natural to ask the cause of this sadness. "Ah, well," said he, "we all try to do the best we can for ourselves, and as I get more profit out of selling American cheese than by supplying Cheddar cheese, those tourists got Yankee samples."

Those "editors, professors, champion cheese makers, 'experts,' and the like," who got cheese made in the United States for "genuine Cheddar," were, without doubt, loud in its praise. Unquestionably, it was good cheese, and, quite as important, it was partaken of without any prejudice against it, but rather in expectation of its being first-class.

The second item is as follows:—

Cheese is cheese and not chalk, and there is a steady determination in many quarters to improve the make of cheese in the majority of Scotch dairies. The subject of the better production of this toothsome article of diet is so much the vogue, that it will be astonishing should merchants continue to have complaints to make similar to those with which we have been familiar in somewhat recent times. The Stewartry Association has opened a dairy school at Craigley, under the very able management of Mr. James McAdam, and that, together with Mr. Campbell's scientific and laboratory work and Mr. Alex. Tood's itinerant instruction, ought to place farmers, in that quar-

ter, in the very front as Chadder cheese makers. It seems too absurd, however, in view of all that has come and gone, that the system under which cheese has been so much improved in former years, should be scouted by men professing to write in the dairy interest. The best makers have all, in one form or other, followed the American methods."

It is as plain as a pikestaff that the grocer who blamed the "Yankees" for knocking out the genuine old English Cheddar, did not know the improved article was made on that part of the American continent usually called Canada, and it is equally plain that the "editor, professor, expert," or whatever he is, who edits Hoard, is not yet aware that Canada is as much America as that part of the same continent where they produce wooden nutmegs, filled cheese and similar Yankee notions. So the "American" editor, not the English grocer, goes on complacently to remark:—"Here we have the candid confession that the best makers follow the American methods."

Of course they do, but the methods and the men are both Canadian, as every Scottish dairyman knows. You are right, Brother Hoard, in advising, as you do, the butter and cheese makers on your side the fence to send no more filled cheese or oleo butter to England. But it will take a few years of honest work before you can acquire a character for "American" cheese, which Canada by skill and honesty has already won for her "Cheddars."—*North-West Farmer.*

ENSILAGE.

During the last week we have heard a good deal of talk about resorting to the making of ensilage this year. The idea has no doubt been accentuated by a report in some of the London papers that as the present season ends a certain cycle of seasons it is sure to be a wet summer, as its corresponding predecessors have been. We have the utmost respect for those worthy and observant people who can see further into the future than anybody else, but we should be extremely sorry to allow their prognostications to influence us in the determination of any important point of farm practice. At the present juncture, however, the question is of some importance to farmers in the South of England who are just now on the eve of commencing the cutting of trifolium, and when

the climatic conditions are such as to render it utterly impossible to make good hay.

Fifteen years ago few people would have thought of attempting to preserve grass or fodder crops except in properly constructed silos with one or other of the various patented appliances for compression. During recent years, experience has taught us that various modifications of the process can be practised with advantage, and that a silo is by no means indispensable. Judged from a strictly economic standpoint there is no doubt that a cheaply-constructed silo is preferable, as the percentage of waste on the outside is so much smaller, and the regulating of the temperature more easily controlled. We have to bear in mind, however, that the result of experience in the use of ensilage with the ordinary farmer is that he will resort to this method of preserving his grass in cases of emergency only. In other words the ordinary farmer will only make ensilage if he cannot make hay. This we believe to be sound practice on all mixed farms. In the case of grass farms, where there are no roots, the practice of preserving a portion of the crop in a succulent state is no doubt an excellent one, being the cheapest possible substitute.

In another week the cutting of trifolium will be pretty general in the south, and those who are at present undecided as to hay or ensilage will soon have to make a final decision. In the majority of cases the weather will be the determining factor. If the present unsettled, rainy state continues a good many farmers will no doubt decide for ensilage.

In doing so it would be well to bear in mind that the clover should be cut directly it comes into bloom, and that good ensilage can never be obtained from partially dried grass or clover. The sooner it is carted to the rick after being cut the better. No amount of rain during the process of carting will in any way injure it. The size and position of the silo rick must be determined by circumstances. The wider and broader it is the better, the chief point being to reduce the outside surface to a minimum, and to compress the sides as much as possible by tucking or cutting after the first day's carting has been trodden or rolled down by men or horses. If the heap is a large one the carts may be drawn on to it in dry weather to unload. The more the sides are compressed the less will be the proportion of waste on the outsides.

The most difficult part to the inexperienced is

the regulating of the temperature, so as to produce sweet or sour ensilage at pleasure. When a very large heap or rick is put together rapidly the result is almost certain to be sour ensilage, because compression takes place so quickly that there is not sufficient air (oxygen) present to raise the temperature of the heap high enough to kill the bacteria which sets up the acid fermentation. On the other hand, if a day or two is allowed to elapse between the times of carting the temperature increases, and the result is sweet silage. Should four or five days elapse a mouldy layer will form on the top, and this should be guarded against. If the temperature does not rise above 125 degrees the result will be sour ensilage, if above that the silage will be sweet. After carting is finished the easiest and most effectual way of compressing the heap is by building a rick of hay on the top. Other means are often resorted to, such as the placing of planks on the heap and weighting them with stones, sand, or earth. By the latter method the percentage of waste on the top is greater.

As far as our experience goes with the feeding of silage to cows, sheep and store cattle, sweet silage is much preferable, because stock eat it better, but we have to confess, after a good many years' experience, that we have never yet been able to feed it to cows for any length of time without tainting both the milk and butter. Our experience is also averse to feeding it to sheep in large quantities, in place of roots.

A. MURRAY.

The Farm.

LUCERNE.

STE-THERESE, June 16th, 1898.

Dear JENNER FUST,

I return your proof-sheet. I shall endeavour to send samples of soil to Mr. Shutt, as suggested. The field is all sand down to 4 feet, as you will doubtless remember, where I dug up a three or four year old lucerne stem, the tap-root of which measured 4 feet 4 inches. There had been a pile of manure, on the large patch I shewed you, although this does not account for failure on smaller patches. I have reseeded patches on this lucerne field before in the spring, by hand raking in, and

covering over with some fine manure, but was unsuccessful in obtaining desired result. Thinking that too much manure might have hurt the seeds, I also reseeded the patches without any manure, but with similar want of success. This spring my farmer tried putting white clover on these patches to fill them up, if possible, but very little of it came up. What sized sample of soil am I to send to Mr. Shutt for analysis? Lord Dundreary idea of a pill-box, would probably not be sufficient.

Probably a small sized tomatoe-can would fill the requirements.

You say, that on May, the 27th, the country was looking splendidly, so, it was, but, considering the early start we got, both oats and hay, on my farm, at any rate, are not nearly as forward as they ought to be. My farmer says it is owing to cold nights. We have not had a really hot night yet. There is a lot of clover growing, but timothy is backward, the new meadows are doing well, but the old ones are not doing so well. I agree with you about lean hams and much prefer one of the old fashioned Yorkshire hams.

The only lean hams fit to eat, are the Spanish hams, from hogs fed on chestnuts in the woods. You used to get those in London, but they never come here. You misunderstood me, about carting clay, on the lucerne field. I intend doing that on a small paddock quite close to the stables and to the beaver-meadow, where I can get all the clay I want. I very stupidly managed to cut my knee with an axe, on the 27th of May, and have not been able to ride up to date, but shall be able to do so in a day or two now. As I ought to ride three horses every day, this has been a nuisance. I hope to get into town by early train to-morrow, and shall try to get up to see you.

Very sincerely yours,

C. F. BOUTHILLIER.

THE DRAINAGE OF GRASS LAND.

Necessary for grass as for arable land—Increase of crop and better quality—Effect of rain-fall—Warmer Soil—Capillarity.

An impression seems to be very prevalent, that however necessary effectual drainage may be for other farm crops, it is of little consequence if grass land be undrained. No one who is accustomed to notice water logged grass lands can fail to be

impressed by the worthless nature of the herbage they produce. If the expense of the remedy were out of proportion to the benefit to be derived from it, then we could understand that apathy might be excusable. But as to the greater part of the undrained grass land which is now lying in a comparatively unprofitable condition through excessive moisture, there is no doubt that the vegetation can be immensely improved in quality. Drainage of pastures has never been known to be other than beneficial; and in most instances the quantity of hay or feed will also be greatly augmented, although for some land already giving a large bulk of herbage of a low quality no immediate increase may be apparent after draining. The total bulk may even be temporarily diminished. But the loss will be confined to those plants which possess little or no feeding value, and therefore regret need not be expended on their disappearance. And, as a rule, the work can be carried out at cost which will be returned with interest in the course of a very few years. Drainage alone will go a long way towards turning a marsh into a profitable pasture, and it renders other improvements possible at a trifling expense. Every year more water passes through land which is naturally or artificially drained than through soil which is generally saturated with moisture. Where stagnant water lies no rain can enter; it simply runs off the surface by any outlet it can find. The soil can neither properly appreciate any fertilizer applied to it nor is it capable of utilizing the sun's heat for the development of plant life. When rain falls on a well drained field it does more than merely moisten the soil and supply plants with water. It has been computed that in each year by rain (and snow?) alone ten pounds of nitrogen are deposited on every acre of land in any district having an average rainfall. Indeed, rain carries into the soil a very large amount of the atmosphere, and this is one of the benefits which result from good drainage. The oxygen sweetens and converts injurious organic substances into wholesome food for plants. At the same time, carbonic acid gas derived from rain and air performs the same operation for the mineral constituents of the soil.

Another advantage which results from draining is an increase in the temperature of the soil. It is well understood that evaporation produces cold, and the more rapid the evaporation the greater the cold. People who have travelled in tropical

climates tell us that water is often drunk from porous jars and is delightfully cool even when the thermometer may register over 100°. This is an illustration of the conditions which prevail on a hot day with waterlogged land. The more scorching the sun, the colder the soil becomes immediately beneath the surface. The sun will make the top crust feel warm to the touch, even when full of water; but if you put a thermometer through into the subsoil it will be found to be intensely cold. The temperature cannot even be increased by rain, for warm water is never known to descend naturally. The rainfall remains on the surface, instead of sinking into the soil and raising the temperature in addition to its many other benefits.

When the sun's rays cease to fall on undrained land the cold subsoil quickly brings the surface to its own low temperature. Surely, therefore, there need be no wonder that under these adverse circumstances the grass on badly drained land is late to begin growing in spring and early to cease in the fall.

A well known European scientist has clearly shown that there is an intimate connection between a warm dry soil and economy in cattle feeding. Friable land absorbs more heat than land which is saturated with moisture, and retains the heat for a longer period. Upon the one, animals lie warmer, especially at night, than they do on the other. Now a large proportion of the food consumed by animals is utilized for the production of the heat which is constantly given out from their bodies. Therefore it follows that additional food becomes necessary to replace the animal heat lost by the colder surroundings.

Land which is properly drained comes under the influence of another operation of Nature, to the great advantage of the crops upon it. Water would, after it has passed through the surface to the subsoil, be lost to plant life, were it not for the wonderful natural arrangement known as capillarity. As the surface soil becomes freed from water, it draws up and re-absorbs moisture from below; and it is especially when the soil becomes dry, and its particles are broken up, that it possesses this power. The water which is thus brought from the subsoil contains some of the mineral constituents from the formation below which further aid the growth of plants. This fact accounts for the widely different grasses which are

to be seen in old pastures on surface soils that appear to be identical.

The mineral constituents in a state of solution are brought up by the water from considerable depths, and by this means, amongst others, the geological stratum asserts its influence upon the herbage growing on the surface. It is a great mistake to suppose that the rainfall goes direct to the drains and is at once expelled from the land. On the contrary, the rain sinks into the land until it meets and mixes with the subsoil water, and the drains do not begin to run until the water rises above their level; and while water, however small the quantity, is flowing in a drain, and probably long after it has ceased to flow, it may be taken for granted that the subsoil is saturated with moisture up to the level of the drains. (1) The rise and fall of the subsoil water are therefore determined by the level of the drain rather than by the surface of the soil, as it would be in an undrained state. Thus, in well drained land, the atmosphere is being continually carried into the soil by rain, and forced into it by atmospheric pressure as the subsoil water falls to a lower level, and the air is expelled when the water rises.

WALTER S. G. BUNBURY,
Compton Model Farm.

(To be continued.)

THE CARE AND MANAGEMENT OF GRAZING LAND.

**When to begin pasturing—What stock to put on the grass—When to take cattle off pasture
Spreading manure—Water; Shade and shelter.**

To graze land properly needs a good deal more thought and care than is generally given. Two main objects should always be kept in view (1) the constant progress of the stock, and (2) the maintenance of fertility in the pasture. Young cattle and sheep must always be kept growing, and the grass should be so fed off as to avoid waste and yet ensure continuous herbage. Allowances have also to be made for differences in seasons. In dry summers what little grass there may be is extremely valuable for its high quality and sustaining power; but when vegetation is rank and sodden with moisture a much larger quantity may

fail to put on flesh. There is an old saying that "the farmer's eye makes the beast fat."

No precise date can be given for beginning to graze pastures in the spring. For instance, cattle will be turned out earlier this year than they were last, the season is much more forward. Cattle should not be turned out until there is enough feed to keep them without too much help from hay, etc., nor until the ground is firm enough to prevent their hoofs from damaging the young shoots of the grasses. On the other hand, if the grass gets too old before the animals are turned out on it, they will refuse much of it and it will not be properly fed down. Even after cattle have made a start, late spring frosts or a persistent cold wind may upset the grazier's calculations, and the stock may begin to go back through scarcity of food. Then a supply of hay, mangels or ensilage will prove a great boon. When sheep begin to graze in mixed pastures they will probably keep the plant down close; but as herbage grows more rapidly, young horned stock should be added, so as to feed down the long grass stems and flower stalks which the sheep pass over.

In temporary pastures, where there is much cocksfoot or orchard grass, neither cattle nor sheep will eat all the stems. When this is the case it is necessary to run the mower over the pasture to prevent a copious seeding of this grass, which, however valuable in suitable proportions, is quite a pest on certain soils when allowed to predominate. It is a good plan to allow cattle to graze in one pasture by day and turn them into a different field at night.

A pasture specially adapted for fattening bullocks should not, as a rule, have a sheep upon it, (1) and a perfect sheep pasture should never have the grass long enough to feed a bullock; but for an ordinary pasture, devoted to mixed stock, probably the aggregate produce will not be used except by a judicious combination of horned stock, horses and sheep. (2)

Nothing evidences a successful grazier more clearly than the skill displayed in taking advantage of the special characteristics of different fields. By so proportioning the stock as to feed the crop down evenly, the pasture is benefited, and by changing the animals from field to field a differ-

(1) Except after the bullocks are sent to market. All the great English graziers put sheep in their pastures in winter. Ed.

(1) Very good and true. Ed.

(2) Horses and sheep both bite close to the ground. Ed

ence of diet is ensured, for scarcely any two pastures produce exactly the same herbage. Calves need the best grass that can be given them, and they generally thrive better alone than when mixed up with older animals. As fat beasts become fit for the butcher they often get very dainty and will leave behind a lot of feed. This should be got rid of quickly by crowding the field with store stock. The best plan is to start the stock on the worst pastures on the farm, and gradually move them on to those that are better. Stock which have once had good food will not take kindly to that which is inferior. A stringent rule cannot be laid down as to when grazing land should be cleared of cattle for the winter. It should certainly be in time to ensure ample pasturage in the spring, but the grass is better when eaten down fairly close before cold weather sets in, and it is surprising how cattle will eat up some of the coarse grasses late in the fall which they would not eat during the summer. Frost no doubt sweetens these coarse tufts and makes them more palatable.

The necessity of scattering the droppings of cattle is well understood but very often neglected. Large unsightly patches of grass appear which the animals will not touch. If a bush harrow or a chain harrow be run over the pastures in the early spring, all the droppings will be scattered about and the young grass will get freshened up. The best time to harrow thus is when the grass is slightly damp, but not at all wet.

A supply of pure water is a matter of great consequence for the animals. It is often found that cattle will drink bad and impure water, such as a horse would not touch, but it is very bad for them and especially for milking cows.

Shade and shelter are also helpful to cattle and if possible it is a great benefit to have some open sheds where they can go to get away from the fierce sunshine and the flies. These sheds are also very useful in spring and fall as they afford protection from winds and cold and heavy rains.

WALTER S. G. BUNBURY,
Compton Model Farm.

REPORT ON THE STATE OF THE CROPS, BAD WEEDS, ETC.

To the Editor of the *Journal* :

DEAR SIR:—Unless some unforeseen accidents or events take place, there will be an abundant harvest; everything is looking now as if we should

have one of the best crops we have had for some time; not only of grain but of small fruits as well.

Grain of all kinds is growing very fast. Barley has headed out and has a fine appearance.

Although corn needs heat it is doing very well this cool weather, though in some few sections, where the soil is rather damp and cold, it looks yellow and sickly.

Potatoes doing well; the beetles are rather worse this year than usual—give them a dose of Paris green: that settles them in quick order.

Other roots of all kinds are doing remarkably well especially turnips. I forgot in previous reports to inform you that there is lots of tobacco grown in this Province of ours, taking it in connection with dairy matters it works very satisfactory and well. Some farmers in Montcalm county last year had 5 and 6 acres, for which they received \$1,000 for their product, and in some cases over that amount. In order to keep the tobacco clean and attend it properly these farmers require a good deal of help, these hired men and young women can milk night and morning and with the creameries and cheese factories the milk is taken there. Tobacco also needs plenty of fertility, so the manure of the herd is used for that purpose. When I was in Ontario, in the early part of May, quite a few there were making inquiries about the raising of tobacco, were writing to the Department of Agriculture at Ottawa for information. It is not unlikely, if the present war continues between the United States and Spain over Cuba, that tobacco raising might be a very profitable one. There has been a green worm that has eaten the tobacco plants this season, so that in some sections they have had to be replanted two or three times. Clover is an extra crop this season; some fields will be very hard to cut and save, too heavy. Older meadows have some clover and will be a fair crop.

The pastures are extra good, and consequently the receipts at the dairy factories are on an average about 20 per cent more than last year; the make of cheese during May was lighter than usual, the shipments to England have been something over 100,000 boxes less than last year, while the shipments of butter are three times as numerous. Until the present date the creameries have paid nearly as much on the average, per 100 lbs. of milk as cheese factories, and then the skim-milk was much better for young stock.

The prices for butter and cheese are tending upwards, rather bearing out the opinion that I had last month of these articles. I have travelled over a considerable portion of this province and I am sorry to see such luxuriant crops of bad weeds, such as wild daisy, mustard, couch-grass (*chicout*) and sweet clover. Many farmers are careless and negligent. In my younger days, there never was allowed to grow on my father's farm such a thing as mustard, daisy, or the common thistle. If the beautiful yellow of the wild mustard were only gold, a good many farmers in the province of Quebec would never need to go to the Klondike. I do not think there is any place that can grow such great crops of sweet clover as around where I am living, Chateauguay. Mustard also seems to do well, while for daisy, Terrebonne, Assomption and perhaps Berthier. The farmers of this country have got to awake from the lethargy which they seem to be in at present, and understand they should grow something useful instead of such trash. Summer fallowing and hoed crops if properly done would clean the soil quickly. Ontario summer-fallows a good deal, and they have also lots of hoed-crops. Keep the soil clean, do not grow too many weeds, practise economy, and you will soon grow prosperous.

Yours truly,

PETER MACFARLANE.

Chateauguay, June 25, 1898.

HOW PLANTS FEED.

In order to grow, a plant must have food at its disposal. More than that, it must be able to avail itself of such food. Hence it is necessary to enquire *how* plants feed.

In the crops of the farm there are two sets of organs of nutrition; the roots and leaves. Each of these is engaged in absorbing materials which can be locked up by the plant into the structures of which it is composed. The roots take material from the soil, the leaves from the air.

Of roots there are two kinds; one is the tap-root; e.g. radish, carrot, parsnip, etc. The second is the fibrous root of which the onion, wheat barley and all grasses afford good examples.

Roots have a *mechanical* duty; that of fixing the plant in the soil. They, moreover, have a physiological duty, that of obtaining food for the plant out of the soil. As the extremely delicate cells at the growing points of a root would be injured by

the rough contact of the surrounding earth, they are protected by a thin cap of dead and dying cells which fits on the tip of the root very much like a thimble over the tip of the finger. As the root grows amongst the particles of earth the little root cap is pushed along in front. To bring the root cap into view it is generally necessary to cut a section and place it under a microscope.

It is the root fibres with their delicate hairs, that are chiefly engaged in obtaining plant food from the soil. These are made up of cells through whose walls solid matter cannot pass. As a result therefore all food must enter the plant in a soluble form. It has been proved that the presence of potash, lime, magnesia, iron nitric acid, phosphoric acid and sulphuric acid is *absolutely essential* to the growth of plants. These are held in the form of weak solution in the water contained in the soil. As the solutions of plant food are very weak, it follows that a large quantity of liquid must be taken in by the plant in order that it may obtain the necessary materials essential to its growth. Now any structure consisting, as a plant does largely, of cells would become so turgid by the absorption of an excessive quantity of liquid that it would eventually burst, unless there were some means of relieving the pressure. Such means are afforded by the *leaves*. Usually they are flat extended structures from the surfaces of which water passes off as invisible vapour, in a word, it evaporates.

The dissolved substances that the water carries into the plant from the soil do not evaporate but stay in the plant. Thus an actively growing plant may be regarded as a net-work, through which water is continually flowing and giving up something in its course. The evaporation of moisture from the leaves, in the manner described is known as *transpiration*. The quantity of water which thus passes through a plant from the soil to the atmosphere is very great. A maize plant was observed to give off as much as 36 times its weight of water between May 22 and Sept. 4, a period of 16 weeks. Barley, beans and clover during the 5 months of their growth transpire as much as 200 times their (dry) weight of water. A large oak tree will transpire about 10 to 20 gallons per diem. A sunflower 5 ft. high will transpire a pint to a quart of water during a hot summer day. Land under crops gives up more water per acre than an adjacent bare fallow on account of transpiration.

A function of the leaf not less important than that of transpiration is that of *assimilation*. Transpiration is a source of loss, assimilation is a source of gain to the plant. Leaves possess the property of breaking up the carbonic acid gas of the atmospheric air, of retaining carbon, and of setting free the oxygen. As the dry substance of a plant is made up chiefly of carbon, it is plain that a plant must be largely dependent for its food upon the activity of its leaves. The separation of the carbon from the carbonic acid gas is effected in the green cells of the leaf. When a section of a leaf is examined by means of a microscope, what are called *palisade* cells are seen in the upper region placed side by side in rows. As the lower surface is approached, the cells are seen to be the more loosely collected together so that air spaces exist between them. Both the cells in the *spongy tissue* of the leaf, and the palisade cells, are green, and the reason the under side of a leaf is usually paler in colour than the upper surface is that the green cells of the upper side are more closely crowded together. Over the whole leaf there extends a thin transparent skin, the *epidermis*. But the epidermis is not entire, for it is crowded with innumerable apertures called stomata (From the Greek for a mouth) each stomata being formed of bean shaped cells with their concave sides towards each other. By the straightening or bending of these 'guard cells,' the size of the stomata is controlled, and it is dependent upon external conditions of light and moisture. As a rule the stomata are far more abundant on the *under* than on the upper surface of the leaf.

Through the stomata, the air which exists in the air spaces of the leaves is directly continuous with the atmosphere. This *intercellular* air passes freely through the porous walls of the leaf cells. These are living cells containing what is known as *protoplasm*, the granules of which are stained to a green colour by means of *chlorophyll** (see note.) It is in these chlorophyll-bearing cells that during day light, the carbonic acid gas is decomposed, the carbon retained and the oxygen set free. Combined in a certain proportion with hydrogen and oxygen the carbon forms *starch*, a carbohydrate which may be changed into other carbohydrates such as sugar and cellulose. The cell-walls are made up chiefly of cellulose, and wood consists almost entirely of cellulose.

Hence, the green leaf is practically a laboratory in which starch is made for the use of the growing

plant; or, the starch may be stored away for future use, as in seeds, and stems and swollen roots, as *store houses* of nutriment.

It is only during day light that carbonic acid is broken up. During the hours of darkness the granules of starch undergo a change whereby they can be transported in solution through the tissues of the plant to the places where they are needed for purposes of growth, repair and accumulation.

During day light, plants exercise a purifying effect upon the atmosphere; in that they consume its carbonic acid and return oxygen in its place. In the dark when the junctions of chlorophyll are suspended—this is not the case. It can be shown that green plants during the hours of darkness consume oxygen and evolve carbonic acid gas. This process indeed is *always* going on during the life of a plant for protoplasm cannot thrive without oxygen. In the day time, however, the quantity of oxygen set free by the green plants is largely in excess of that consumed so that the general result is to enrich the atmosphere in oxygen. The slow and incessant consumption of oxygen by the plant is known as *respiration*.

Leaves therefore afford means for the discharge of the three functions of transpiration (loss of moisture), assimilation (gain of carbon) and respiration (oxidation.)

How lifeless matter can be transformed into living material no man can tell. The secret lies hidden in the plant cell.

NOTE.—*Chlorophyll*, the green colouring matter of plants may be conveniently extracted from parsley. Place a handful of the freshly gathered plant and dry it on a dish before the fire and let it remain so till every particle of moisture is extracted. Then press into a tumbler and pour some alcohol upon it. Next day pour off the liquid into a test tube, held up before the eye and the light the solution is seen to be green. Looked down upon, the eye between the light and the solution, the latter is seen to be claret-coloured. Thus a solution of chlorophyll is seen to be green by transmitted light and claret coloured by reflected light.

A. H. PLUMMER,

June 1 1898.

Compton.

DRILLING.

Drilling is much the best way of sowing barley, although broadcasting may be done in certain cases. The success of barley growing is largely

due to uniformity of conditions, uniform quality of land, uniform manuring, uniform depth of till, uniform sowing. All of these points should be aimed at, and barley should, never be sown on a patchy bed. As to distance apart of the coulters 7 or 8 in. are usual and unobjectionable.

Thick seeding produces weak straw, and this must produce weak grain. It is unreasonable to expect stout grain from poor, thin straw, as it is well known that in the process of ripening the grain is nourished from the straw. This points to moderate seeding and fairly wide drilling, so as to secure a well-developed plant. This point is important, and is worthy of discussion. Wherever the drill has crossed its work at the headland, and consequently sown double the seed, the straw is wiry and the yield poor and this show the evil of excessive seeding. On the other hand to sow poor land with 2 bushels per acre is too likely to result in a deficient covering of plants. The quantity of seed must then be decided by good judgment, and will be found to vary from 2 bushels per acre where pedigree seed is sown in good land, up to 4 bushels per acre in poor chalky soils. It was only last year that a carter explained to me while drilling that poor land should be thinly seeded, because it was poor, and could not therefore support a numerous progeny. The argument is, however, fallacious and imaginative. The true view is that poor land must be well seeded because the plants will not "tiller," "stool," or branch out, while on good land a thin plant will spread and fill the spaces. This is no doubt, more true of wheat than of barley, but it is to some extent true of both crops. (1)

JOHN WRIGHTSON.

The Poultry-Yard.

HOW TO IMPROVE COMMON FOWL.

The common hens are of all shapes and colors that fowls ever grow, and they are usually neglected, abused, half starved, and left to shift for themselves generally, but for all that they generally lay their way, and something besides live and thrive, and bring out and rear big families of healthy chickens under the most discouraging circumstances. Our common hens are extremely

hardly good foragers, mature fairly early, are good layers, good setters and excellent mothers, and if you cannot afford to start with a flock of pure bred fowls, I can assure you it will pay to start with common hens. Take the same trouble with them that you could with a stock of thoroughbreds, and they will respond quickly and generously. There is—a good deal—in blood, but then there is also a good deal in care and feed.

If size is what you want, select your largest common hens and mate them with a cock of some of the larger breeds; such as the Plymouth Rock Wyandottes. If your object is egg production, select the hens that you know to be the best layers; and for any other special purpose, select males from a breed that possesses the qualities that you may desire.

Chickens from these crosses will be half-blood, and much superior to common fowls. The next year mate the best of the half blood-pullets to pure bred cocks and keep the best of the pullets from this cross for breeding stock the third year. In this always keeping your best hens and pullets each year and using only thoroughbred cocks you will in a few years, have a flock of fowls that for all practical purposes will be just as good as though you had started with thoroughbreds.

If you cannot afford the money to buy pure bred cocks to mate with hens to begin with, do not despair and think that you can do nothing towards improving the stock of common fowls. Common fowls can be greatly improved in point of size by always selecting the largest and best to "keep over" to breed from; and the laying qualities can be improved by always setting only eggs from the hens that are known to be the best layers. On some farms where this course has been steadily followed year after year, the fowls have greatly increased in size and rival the Leghorns and others that are called the heavy layers such as the Houdans, etc. I have in mind now the case of a young farmer who in four years from the time he began improving his stock the average product from his flock has increased one third and he sold eggs in 1896-97 during the winter months at prices from 35 to 40 cts. per doz. for incubator purposes for market broilers. Another case when a young man not more than 20 miles from Montreal began the same process with a few common hens in 1893 has so improved his flock that he has for the last three years been using incubators and hot water brooders and has made a market in

(1) Right in every respect. Ed.

the city of Montreal for himself for all the stock he can raise from his own eggs and buys from others to keep his incubators going from the first of November until the first June. During the winter of 1896 he told me that on the first of June he could not supply the demand for broilers at long prices varying from 35 to 50 cts. per pound. And he intended to increase his plant from year to year as he considered it the best paying product of his farm. As it occupied time during the winter months that could not be otherwise utilized on the farm work, he is now using three incubators and a brooder house heated by a spence heater. The house is 180 feet long and 18 feet wide divided into pens suitable for the chicks until they are sent to market from the time they weigh from 2½ to 3 pounds per pair live weight. I am not writing this for the sake of writing, but from the facts with which I am personally acquainted, and with the hope of inducing other of our young farmers to go and do likewise. What one man can do another one can possess with the same will and energy. Do not think for one moment that I am in favor of the common fowl or scrub hen over thoroughbreds of the improved varieties, for it is not the case. I believe in improved varieties of fowls, believe that thoroughbred and very high grade fowls will pay the farmer and market poultry raiser better than common fowls. Just as certainly as the thoroughbred and grade Jersey or Ayrshire cow will pay the farmer and dairyman better than a common cow. There are very many of our farmers who have been reading the Agricultural Journals and attending the conferences of Horticultural and Agricultural societies who know the benefit that has come to them from that source, who have also been taught to always begin with the best implements, stock and seeds. Many possibly think that it will not pay to start until they have money enough to buy a flock of high priced thoroughbred fowls, and I am trying to show them that it will pay to start with just the common hens they have already on the farm and improve the stock as they go along.

In the second case I have mentioned, the young man started with a single incubator of 100 egg capacity and bought eggs from the farmers in his vicinity taking the best he could get from them, selling the cockerels for broilers and keeping the best of the pullets for eggs in the next season, selling off the following spring those which were not good layers, he has made it pay its way right along, so

that the third year he cleared \$300.00 between the first of November and the first of July from his poultry plant alone, he is now using one incubator holding 100 eggs, and two holding 200 eggs each, his brooder house is not expensive, not costing him over \$130.00, he has found it to pay him as well if not better than his small fruits or orchard, his laying stock and young pullets have the entire range of his farm in the summer after seeding time until the snow comes, the result is that now he has laying stock enough to supply or nearly so enough eggs to supply his incubators, in any event it pays him to buy eggs at 35 cts. per dozen for hatching, for broilers which he has no trouble in selling in the city of Montreal at good prices, live weight, therefore, has no expense for dressing or killing, he raises all the food for them on his own farm, although not a large one, showing the result of pluck, energy, and perseverance.

Last winter I met a farmer at an exhibition who said he was clearing \$1.00 a year per fowl, plus what was consumed by the family. I was not surprised to hear he had cared for and loved poultry from boyhood up. He said, as stormy days came, when other farm work could not be attended to, he desired no better amusement than sitting down on an overturned box or measure in the poultry house watching and studying his hens. Does it not take patience, ultimate acquaintance and considerable ingenuity to reach and please our human friends or relatives? Why then should any poultry farmer expect less could make a success of his feathered companions? Know your birds and their habits and you will be surprised at the pleasure as well as profit you will gain by so doing.

S. J. ANDRES.

IMPROVEMENT OF STOCK.

Very often the question has been asked as to the best method of starting poultry keeping or of improving the present stock and I shall endeavor to consider the matter. Now that it seems to me that the farmers are paying more attention than formerly in the direction of keeping better poultry more especially with regard to the profitable side rather than for the pleasure of it, it is essential that the first steps taken shall be on right lines; otherwise they may have to be retraced at great expenditure of both time and money.

The first point which deserves our notice is—what object has the poultry keeper in view? of course there are multitudes of farmers and cottagers who keep poultry and they simply desire to obtain eggs as many as possible, and to have a fair number of chickens. When this is the case, the only thing to do is to select the breed or cross most likely to help in this direction.

But where there is a better market for one class of produce than the other, then it is a most desirable thing to make that class the main object, and to regard the other as merely a secondary consideration. What I mean is simply that in a district where eggs are chiefly in demand, the wisest plan is to use breeds that will give the greatest number of eggs, regardless of whether they have table properties or not. The latter point must be sacrificed—in fact it will pay to do so. In the case of table poultry, we must naturally be content with fewer eggs but there the return comes, in the direction of increased flesh qualities and greater prices for the same.

There are several varieties which combine egg production and table qualities, though in neither respect do we get quite the same result as with the special breeds. Suppose that a farmer or cottager intends to take up poultry keeping, the question naturally arises upon what lines will be conduct his operations. We have heard from time to time glowing accounts of the profit that can be made from poultry-keeping and if we believe all these statements there could be no doubt that poultry-keeping would be one of the most attractive industries in the country. But the stern logic of facts shows us that the overcrowding of any animals upon a limited area means disease in the long run.

I could give numberless instances of mistakes made in this direction, but it is not necessary to do so. In the case of the farmer, I desire to induce him to regard poultry as an important branch of his live stock, to give them the same amount of attention as the larger animals and under these conditions, there is no doubt whatever that poultry can be made an important aid to the general success of his business. But he must observe the same laws as he does with cattle and sheep. That poultry might be kept to a very much larger extent than is now the case cannot be questioned. The editor of an American Poultry paper who has been on a visit to Flanders, (Belgium), where he has been travelling in the rural districts, says that

of late years there has been a remarkable development of poultry keeping. Hedges are practically unknown in that country, and the fowls are permitted to wander where they like even among the growing crops doing no harm in fact, not one thousandth part of the harm that wild rabbits do. In the Campine country, there has been a great increase in the fertility of the land during the last twenty years and this is attributed to the numbers of poultry kept. I can scarcely recommend that course to our farmers here but going back to the farmer, of course queries as to breeds and housing will come up. The best system of housing is to put the birds in good warm houses in small flocks of 25 or 30 birds in each roosting house with scratching sheds attached for winter use and grass runs for summer.

When we come to consider the case of the farmer or villager who has already a flock of poultry which he desires to improve and develop, so much is to the good, because as he knows probably what is the most profitable branch of poultry-keeping in his vicinity he has only to start in to develop his flock for that purpose. Too often, however, a great number of fowls are kept, sometimes until they die of old age, herded together in one house and allowed to run over the same ground, as they have done for years previously. This system is certainly all wrong. The first thing he must do is to get rid of every bird in the establishment more than a year and a half old and the sooner he does this the better. It will pay to cut his stock down to comparatively small limits and then to start in afresh. The first thing to be decided upon is which breed to keep and to do this the purpose for which the poultry is to be kept must be taken into consideration whether for eggs or flesh production. If you have some good early pullets or one year old hens that are good layers, and you want eggs, choose a male bird of one of the Mediterranean class whichever one you prefer and thereafter each season or at least second season buy others of his same kind and thus in a few years build up a high grade flock practically full blood so far as results go though, of course, not thoroughbred or fit for sale of settings. Its original foundation of common or mixed stock suited to that farm its care and conditions often produces more satisfaction than a full blooded flock of thoroughbred laid down at high prices. Do not understand me as opposing thoroughbred *breeds* fowls for the farmer. My idea is to show that a

farmer having a flock of good healthy pullets or hens not exceeding 18 months old can by watching his flock and choosing his best layers every season make a flock of fine layers that will yield him as good a profit in the long run as the high priced birds. If you want both flesh and eggs and have the land and house room, you can divide the flock and have two pens as breeders for both purposes. Do not use the males from either pen to breed from, better buy a few settings of eggs from some reliable breeder and raise your own male birds to breed from. If you do not care to buy the birds out and out which I think is decidedly the quickest way to do as you can buy of some good breeder who makes utility his first object and fancy the last: I believe in utility every time for the farmer.

A setting of eggs from purebred fowls may be had for from one to three dollars, a couple of settings of eggs would therefore cost less than one male bird and as with ordinary good luck seventy-five per cent of the eggs should hatch, allowing for accidents fifteen or eighteen good birds should be the result of two or three dollars invested in eggs.

From these hatches all the pullets may be saved, and the money from the sale of the cockerels will be ample to purchase a good cock not akin to lead the breeding hen, of course, we must take into consideration the element of time, also some risks as to the hens employed as sitters doing their duty faithfully. In another article I propose to show how the common fowl can be improved naming the different pure bred varieties to be used for the purpose.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST.)

LINEN SKIRTS.

Only a few years ago, who would have gone to a shop to buy and expect to find a well made good fitting garment.

Yet such is the case to day, one can go into any respectable shop, where they are sold, and find anything required, and also be sure that it will be well made; no slop-shop work, but a well made garment fit to wear at once.

If little alterations are needed, they will be done at once.

One can buy in the morning, and wear in the afternoon.

I saw a very nice skirt, bought ready made, the other day; made of the coarse linen so fashionable just now. It cost \$5.00 and was very nicely made and well fitting. It had very fine piping-cord run in from the bottom to the waist with alternate spaces of about 3 inches between three rows of cord, the 3 rows representing very fine tucks. The skirt seams must be made first but I do not think the ordinary sewing machine could put this very fine cord in so evenly and well as is it done.

This must be done by experts in the business.

I saw the making of a skirt of this same stout linen at a much smaller cost; as there is no bother with lining, it is a very simple affair.

Owing to the stoutness of this linen, great care must be taken in cutting out so that there shall be only just sufficient fulness to sit easily to the figure.

To do this, it has to be very much gored, so much so that it will be smooth and even over the figure.

One well gored front width, two side gores quite narrow on the top, and if the figure is a slight one, (as it was in this case) it will be necessary to gore even the back-width to be able to get the fulness into the band, where it must be gathered, very coarsely, and the same sewn into the back part of the band.

Be sure to press out the seams well before turning up the 4 inch hem at the bottom.

Stitch round the same twice, quarter of an inch between the stitchings, do nothing without measuring and tacking well as you go, to be quite sure that the hem will be the same width all round; do this and you will get a nice serviceable skirt at the small cost of \$1.32. Six yards of linen, at 22 cts a yard, will make this very, nice, durable skirt, and with a bright, pretty, blouse, or skirt-waist, and one of the very nice neck ribbons so fashionable to day, will leave nothing more desirable for a summer's outing, on a hot day.

This fabric will wash well, and for durability nothing can match it.

These skirts can be bought at the small price of from \$3.00 to \$5.00 each, at any good shop; but one must not expect the same good material as the home made ones.

STEEL ORNAMENTS.

We all know how difficult it is to clean the pretty steel buckles and ornaments for our hats and

bonnets, when they have become rusty, and nothing so soon becomes rusty as cut steel. This, I think it its great drawback. I came across a simple remedy the other day which perhaps you may not have seen and may like to try for yourselves. Place the ornament you are desirous of cleaning upon a plate, pour over it a little paraffin, and let it lie for an hour soaking in the oil; then brush it well with emery powder. If you follow these directions I think you will be pleased with the result obtained.

THE COMPLEXION.

It is quite certain that there is no magical lotion which will turn a coarse skin into a delicate one. The methods to be employed in clearing and improving the skin, require patience and perseverance, one of the chief points being the strict regulation of the diet. Greasy foods are notoriously bad for the complexion. Speaking generally, frugal living is best for the complexion. Light farinaceous foods, milk, white fish, and fruits are preferable to the more heating ailments with which our tables are generally supplied. Beef, pork, ham, liver, and kidneys should be avoided. Poultry, lamb, and mutton are very beneficial.

An excellent medicine to cure a muddy or blotchy skin, especially during the spring is flowers of sulphur. A teaspoonful should be mixed in a little milk and taken either at bedtime or before breakfast. For whitening the skin there is nothing better than virginal milk, which is perfectly harmless. It can be prepared at home as follows: To one pint of rosewater add $\frac{1}{2}$ oz. of simple tinctures of benzoin. Add to the whole half-a-dozen drops of glycerine and shake well before using.

THE CARE OF SILVER.

One of the many things that are impossible for the untrained mind to grasp seems to be the fact that if an article is never allowed to become dirty it will never need cleaning. In all branches of housework this rule hold good, but especially so in the case of silver. The average mind finds it necessary to devote a large part of one day out of every seven to scrubbing and cleaning forks, knives, and spoons that should never have been allowed to become dirty enough to demand such exertion. When these articles are once clean they

should be kept in that condition. If after using, each piece of silver is washed in very hot water and wiped immediately dry on a perfectly clean towel, it will retain its lustre for days and weeks. If by any chance a spot of tarnish appears, it can be easily banished by a brisk rubbing with a piece of chamois skin.

YORKSHIRE TEA CAKES.

A great addition to the tea table at this time of the year are Yorkshire tea cakes, and they are equally good eaten hot or cold. Take one pound of fine flour, $\frac{3}{4}$ lb. of butter or lard, 1 oz. German yeast, a little salt, and milk enough to make a soft light dough. Rub the butter into the salted flour. Add the milk and the yeast, and roll the dough out very thin. Make the cakes about the size of a tea-saucer. Let them rise about an hour in a warm place; by the end of that time they should be fully three times their first thickness. Bake in a quick oven. Split, butter, and cut into quarters while hot.

EFFERVESCING LEMONADE.

Rub one or two lumps of sugar on the rind of a large juicy lemon, put the sugar and lemon-juice into a large tumbler, pour on it half a pint of iced water. To make it effervesce, add half a small teaspoonful of bicarbonate of soda or potash.

VEGETABLE AND MEAT SOUPS.

It is said that vegetable soups are more nourishing than and not so heating as those made from meat stock.

COOKING BACON.

Most people find frying the most handy method of serving bacon in small quantities. It will not do, though, to thrust the pan on the stove and leave the bacon to cook itself. Some care is necessary, as, like other things, all bacon does not behave in the same way, and a slice of lean needs to be turned over on to a fatter part to keep it from getting too dry, while another rasher cook more quickly than the rest, so without care the rashers will not cook evenly. In doing small quantities, it is well to put a little bacon fat in the pan. Save it each day when frying, pouring it in a jar to keep it. This plan preserves the meat from hardening. Some of the best cooked bacon

I ever saw served daily among other breakfast dishes. The rashers were cut with mathematical precision, and laid in a large baking tin, overlapping each other, so that each strip of lean was on the fat of the rasher underneath. The tin was then placed in the oven, and left till the meat was cooked. The bacon never varied in appearance, the lean being beautifully tender, and the fat cooked through, but not chippy. Every stranger always asked how the bacon was cooked, and why it never looked done too little or too much.—*London Queen.*

FLOOR COVERING.

No floor covering is so cool and wholesome looking as matting, and never before was it shown in such pleasing variety of coloring and design, but the cheaper grades are not satisfactory when subject to hard wear, and the better ones are too expensive for most of us. It is the best economy to purchase matting by the roll; then when it has become worn the better parts from different rooms can be put together. It should always be laid over heavy carpet paper or several thicknesses of newspapers, and held in place by double-headed tacks which come on purpose.

HOME-MADE FURNITURE POLISH.

Here is a really reliable furniture polish which recommends itself both for cheapness and efficacy. This will do away with the necessary constant renewing of the bought bottles of furniture polish during a long spell of cleaning. The ingredients are as follows:—2 oz of beeswax, 1 oz of Castile soap, half a pint of turpentine, and a pint of water. To mix these, cut up the beeswax and the soap, and dissolve in the water. By heating the water this is more quickly done; then mix in the turpentine, and you have your polish all ready for use.

INFLAMED FEET.

Sore and inflamed feet form a very annoying trouble, which may, however, be cured by attention to the hygiene of the extremities. The socks should be frequently changed, and should be somewhat thick in texture, while scrupulous cleanliness is, of course, a necessary part of the treatment. The use of the following lotion is also calculated to effect a cure: Alum three ounces;

tannin, one ounce; brown vinegar, one pint; rose-water, half a pint. Mix, and apply a little as a lotion after washing the feet.

The Orchard and Garden.

(CONDUCTED BY MR GEO. MOORE.)

“THE ORCHARD IN SUMMER.”

It is considered by many, at least their inattention seems to be speak it, that the orchard needs no attention in the summer season; but this is by no means the case; while the crop is growing, vigilant watch should be kept for all the enemies which will assail it and by remembering the old adage that “a stitch in time saves nine”, many threatened evils may be averted. If the land is not laid down to grass, the trees will be improved by its good cultivation and I am of opinion that better and finer fruit can be produced, and insect, and fungus pests, better kept in check on land which is tilled under the trees, than on grass land. By the former method, the roots are aerated and fertilizers can occasionally be used, neither is there any shelter for the broods of insects, and the spores of parasitical fungi, such as the grass affords. If the land is cropped with some kind of roots or cabbage, it will be kept in good condition and the crop will pay for the labour expended on it, beside.

If hay is growing, the owner will not like to trample it for fear of damaging it and thus he will neglect to examine frequently and carefully the condition of every tree; whether incipient blights, scales, or borers have begun their destructive work, which might be prevented if taken in time and right means adopted. As regards pruning too, I see no reason to alter my opinion that July is the best month to prune, notwithstanding I know that in this opinion I am at variance with some of my respected confrères in horticulture. As I have before stated in print, my reasons for this view of the subject are founded on theories which practice has proved to be correct, I see some authors are of the opinion that summer pruning checks growth, but how this can be I am at a loss to understand. It is a well established fact that cuts made in a tree while the sap is in action, heal immediately, not while it is flowing upward to form the leaves, but when it is returning in the shape of what is technically called *cam-*

bium, that is to say, after it has been elaborated by the leaves, and is in the right condition to assimilate with, and add to the tissues, of which the tree is composed.

If a limb is cut off at any other season the wound has to be covered to prevent decay, and if there is nothing to replace the vital energy, suddenly checked by its removal, the bark will shrivel, dry, and never heal, because the cambium in its descent the following season will find nothing but dead tissue to act upon; whereas, if the amputation were made just at the time the active principle of life and growth was performing its office, is it not reasonable that healing of wounds would be at once effected? I must confess I am at a loss to conceive how persons who possess a full knowledge of the use and action of the sap of the tree can state that it is unimportant at what season of the year a tree should be pruned, especially as practice and results prove conclusively, that the theory as to the quick and certain healing of the incisions is without doubt the correct one.

I should be very grateful if some of our readers who have fruit trees, would make the experiment for themselves this summer, if they have not done so previously, and let us give the public the result; make a note of the date of the operation, and another of the date when the wound on the edges of bark in which the cut was made was healed over, whether any paint or wax was used to cover said wound, which, in my opinion, will be quite unnecessary, and whether trees thus operated upon were in any degree checked in their growth.

At any rate do not relax in your care of the orchard in the summer months, supposing that when you have done your spring spraying you need do no more until you gather the fruit.

While the husbandman slept the devil sowed the tares among the wheat, and the powers of evil are as rampant now as they were then. If we are to succeed we must lay wait for them and do that which experience shows us will counteract their devastating effects. It is no use locking the stable door after the steed is stolen.

The Grazier and Breeder.

ANTHRAX.

Anthrax is the result of the introduction into the blood of a minute rod like body, the bacillus

anthracis, which grows from spores or seeds. The spores are never developed in the animals' body but only when the blood of the victim and its contained bacilli are freely exposed to the atmosphere. This spore formation always occurs when the carcase of an animal dead of anthrax is opened or cut up. Any substance brought on a farm may act as a carrier of these spores. Blood and bone manures, refuse used as manure, hay or other fodder grown on an infected farm, may carry the spores to farms on which anthrax was previously unknown. Diseased animals do not transmit the infliction to others in the ordinary way by association. The bacilli or their spores must be introduced into the blood through a wound or abrasion, however slight, before the malady can be communicated. The carcase of an animal dead of anthrax is far more dangerous than a living sick animal. Where the disease has been known to exist on a farm in the past, one may sometimes, in the case of a sick animal make a happy guess as to the nature of the disease from which it is suffering. But there can be no doubt but that anthrax is often overlooked, for when making an enquiry into an outbreak for the first time one may find that some of the animals had been treated by a veterinary surgeon who never suspected the disease he was dealing with. To proceed to wholesale slaughter and compensation in the case of anthrax would bespeak deplorable ignorance regarding that disease. Even if we could in one day kill and dispose of every animal that harbours an anthrax germ, we should not be appreciably nearer the extermination of the disease, since there would still be spores that lurk in contaminated soil and water, and which are the cause of periodical outbreaks. Where such contamination exists, one invariably finds that it is owing to carelessness in dealing with the carcase of an animal dead of the disease. It frequently happens that an owner does not recognize the nature of the disease, and the carcase of an animal really affected with anthrax is flayed, cut up, and some parts of it given to the pigs and dogs. The bacilli in the blood, thus freely exposed to the air, proceed to form spores which, being almost indestructible may be the cause of further outbreaks for years to come. The most absolute security against contamination of the soil by means of carcasses would be, theoretically, obtainable by destroying them by heat or chemicals, but unless this can be done on the spot, without a preliminary cutting up of

the dead animals, it is in no way superior to burial, and it is certainly more troublesome and costly. Under the usual circumstances of death occurring on a farm, no apprehension need be entertained with regard to the risk of contaminating the soil when burial is immediate and deep, and no mutilations have been practised.

Experimental evidence proves that under certain conditions, easily secured, the carcase of an animal dead of anthrax soon loses its virulence and confirms in a very marked way the opinion that prompt burial of the unopened carcase is a perfectly safe plan to adopt. When a farm is contaminated anthrax is just as likely to appear at the end of six months as the next day after the last outbreak. The incubative period of anthrax rarely exceeds four or five days. Assuming that more than one animal has received the infection at the same time, a period of eight or twelve days is ample to prove it. During this period burial of the carcasses and disinfection of the premises as far as it is found practical is carried out. The present available methods of disinfecting a contaminated pasture are most unsatisfactory. A contaminated field may be thrown out of use for years. Yet anthrax may appear when the products of the field are used as fodder, or the field is again occupied by cattle, although during the long interval every known method of disinfection had been tried.

For the purely veterinarian part of the foregoing I am indebted to an article by Mr. Hickes, Inspector of Cattle for the East Riding of Yorkshire, England, and from which I have drawn deductions, and added experience of others.

W. R. GILBERT.

FORAGE PLANTS AND SHEEP-RAISING.

Professor Thomas Shaw, late of the Ontario Agricultural College, at Guelph, now professor of Animal Husbandry in the University of Minnesota, has been addressing the "Farmers' Congress" of the United States on "The Importance of Forage Crops to the Farmer." This Farmers' Congress is a national affair, and is composed of delegates from every State in the Union, the number of delegates being proportionate to the population of the several States. The Congress has just held a three days' convention at St. Paul. Our old friend, ex-Governor Hoard, of Wisconsin, has

been elected president of the Congress for its next convention. Professor Shaw's address aroused great interest among the delegates present in the convention at St. Paul; and he was frequently greeted with applause and constantly plied with questions bearing upon the subject of his address. Among the points brought out by Professor Shaw were the following :

(1) The question of forage crops is the question of all questions to the farmer. Dairymen, growers of meat and wool, and tillers of soil generally, are all alike interested in forage. No country in the world is more favored in the abundance and variety of its forage crops than the United States.

(2) Speaking of the Canadian field pea, which he characterized as an excellent forage plant, Professor Shaw said that there were sections of the United States where two bushels of this pea could be raised to one on the best pea-producing Canadian soil. Within a few days, in Montana, he had counted 192 pea-pods on one vine—a marvelous production.

(3) Rape is the forage plant upon which Professor Shaw laid most stress. A few years ago, when but 600 acres of rape were raised in the United States, he predicted that the time would come when 10,000,000 sheep and lambs would be fattened upon rape in the United States, and he repeated the prediction now. To-day, he said, there are already probably 100,000 acres of rape growing in the United States, and no less than a million of sheep and lambs feeding upon it.

(4) Professor Shaw thus having mentioned sheep then deplored the unadvanced state of the sheep-raising industry in the United States as compared with what it should be. He said that 250,000 Canadian sheep and lambs are being annually imported into the United States, by way of Buffalo, in face of a high duty; and that Canadian mutton was constantly advertised as such in New York. This market, he contended, should be held by United States farmers, and not be suffered to be captured by Canadian enterprise.

(5) Continuing to speak of sheep, Professor Shaw characterized sheep-raising as the "Agricultural Klondike" of the United States. He said that when he came to Minnesota he was told that sheep could not be profitably raised in that State, and the people who made the statement really believed what they said. In reply he would say

that this year he had a ten-acre piece of ground at the experimental farm, which had afforded forage (a mixture of wheat, oats, barley, and spring rye) for ninety-three sheep since the dawn of last spring until now, and there was forage enough left in the plot to-day to carry the sheep from now until winter, even if the growth were to stop all at once.

We believe that Professor Shaw, after every allowance is made for his constitutional enthusiasm, is on the path of progress when he is advocating that greater attention should be paid to the growth of forage plants for the continuous profitable feeding of stock from earliest spring to latest fall. Just as the introduction of the silo and the use of ensilage have revolutionized the feeding of stock in winter, so will the growth of judiciously selected forage plants revolutionize the feeding of stock in spring, summer, and autumn. We scarcely credit, however, his opinion that the United States affords advantage for the cultivation of forage plants superior to those that Canada offers. And we should like to hear what our Canadian farmers have to say to his statement that our field pea will grow more abundantly in Montana than it will here. We are inclined to believe that under general conditions the Canadian growth will be superior to the Montana growth. Professor Shaw's remarks as to the extent to which Canadian mutton and lambs have captured the New York meat market ought to be of some comfort to our sheep men. It is a repetition of the old story, "the value of a reputation." We trust our sheep and lamb producers will become more earnest than ever in their endeavors to keep none but the best mutton-producing breeds, so that our good reputation for mutton will advance with every year's business. Professor Shaw's enthusiasm in enforcing the advice, "Keep more Sheep," is quite in harmony with our own, and we trust our readers will take the advice to heart, and act upon it.

FARMING.

TERREBONNE COUNTY.

MM. Giroux and Forget, judges at the Exhibition and Competition of the above county, after giving their decisions on the respective merits of the farms, crops, etc., of the Agricultural Society, No. 2, continue their remarks as follows :

"We returned home enchanted with our visit ; in spite of the dissatisfaction evinced by some of the competitors at certain of our decisions ; and utterly astonished at the improvement accomplished in farming in the different parishes, 8 in number, that took part in the competitions.

This is clearly due to the working of the clubs, which are numerous and flourishing, and to the reading of the *JOURNAL D'AGRICULTURE* at the agricultural discussions.

What a change during the last few years ! The cow-houses are kept in better order, better lighted, better ventilated. The cows are better fed, and more care is devoted to the preservation of the manure. Maize, potatoes, carrots and mangels are more largely grown, the pastures are more luxuriant and the crops of hay are heavier. We were glad to see so many chaff-cutters, and such a number of recently planted orchards. All the farmers seemed to be full of confidence in the future, not a single farm-house did we find unoccupied, and we saw with satisfaction that the younger men, on their rocky land, were succeeding very well, in spite of having had to begin in poverty, and that they had some savings in the banks ; a proof that, with industry and economy, a good living can be made in any part of the province of Quebec.

NOTES IN PASSING.

"Cleanliness is next to godliness" in poultry culture as much as in anything else. Clean quarters keep down the lice, prevent sickness and add to the profits and good returns. Lice soon weaken the strongest fowls, check egg production and make the business unprofitable.

Warm houses, good roofs, and clean runs pay for all the attention they need.

Good sharp grit prevents indigestion ; a neglected case of indigestion will lead to liver troubles, then the fowls "go light" and die.

Corn is one of the very best fattening foods, and the worst egg producing grain that can be given. You cannot grow fat and eggs in the same carcass, at the same time. *ANDRES.*