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THE ILLUSTRATED

Journal of Agriculture

Montreal, May 1, 1896.

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PRACTICAL FARMING.

Grasses—Wheat—Banner-oats—Turnips.

WHAT SHALL WE SOW

In anticipation of spring seeding, I hasten to refer to the continuous seeding with Timothy and red clover without admixture with other seeds. I am not in favour of sowing from $10 to $14 worth of seeds on an acre, as some writers recommend, but the usual method of sowing only timothy and red clover is a mistake. For 40 years I have sown red top with timothy and clovers, and in any kind of land, and with every kind of season, I find that there is a thicker heavier growth of hay. I was led to try it from a remark made by a mower in the time of hand mowing. He said he "did'nt like red top because it was so hard to pull the scythe through." He was correct, and I like it for the same reason that he disliked it. I find it makes a thick, heavy cut of hay. In an extra dry summer it is there, and in a wet season it is there just the same. And in a good season for timothy and clover there is still a more abundant crop. And on soft, spongy land, where timothy and red clover seeds would be thrown away, and wild grass have full control, red top, and alsike clover make a heavy growth of good cattle feed.

Some farmers object to sowing it, giving as a reason that it will give horses the heaves on account of the frowsy top. In my experience I have had two horses, troubled with the heaves both however were caused by overdriving and subsequent neglect. It is not necessary however to feed hay with mixture in it to horses. A good manager mows his hay away in three different kinds, the finest hay and clovers for sheep, the timothy for horses, and the intermediate for cattle. I have experimented with several kinds of seeds, but for hay, there is no mixture so good as Red top, with timothy, red, and alsike clovers. Do not mixtake something else for red top: there are over 150 different grasses.

WHEAT

It has been a difficult matter for some farmers to realise that Manitoba wheat with the new process of grinding, makes a better bread than their own wheat flour, ground at the home country mill, with rarely two grists of the same quality, seriously trying the temper of the baker, and the digestion of the eater. Times changed long ago. For 12 years I have not raised wheat. Land that will raise a good crop of wheat, is certain of 50 bushels per acre of oats and barley, or pease. I have raised over 60 bushels the entire crop. There is much more money in this than in wheat, and the straw, if properly saved, is of great value for feed. Whereas, notwithstanding the statements of scientists to the contrary, wheat straw is not worth manger room for any beast, and in a short time on it the horns and bones become prominent features of the animal. As it does not pay farmers to raise straw purposely for manure, it is a study to learn why some farmers continue to sow wheat.

BANNER OATS

Clear for horses, and mixed with barley or peas to grind for pig and cattle feed, will be found an excellent oat for land suitable to grow wheat. The straw stands up well, of great quantity, and an excellent grain of great weight. There is no oat, however, that suits the general culture and soil in the Province, better than the Canada oat, but don't forget to change the seed.

TURNIPS.

For many years I have endeavoured to induce farmers to raise turnips. With those who do not understand the "Modus operandi" the difficulty of raising them at a profit is the serious objection. I do not for a moment suppose that any farmer with experience in feeding will admit the claim of scientists (so called) that there is only about 5 p. c. of food in turnips, and as everything about the crop can be done when there is no other crop pressing, and as they can be raised at a cost for extra manual labour of about 3 cents per bushel, it is one of the best paying crops. Put in properly, they will do well on any land that is rich enough, and dry enough to cultivate properly, a well cultivated clay loam being the best. The first necessity is clean land, and clean manure. The want of this to commence with is generally where the mistake is made. If it is intended to sow on stubble land, it ought to harrowed over immediately after the grain is off, to start the growth of weed seeds. In a couple of week plough 8 in deep, and in a few days harrow well. If the land has been last in hay, it ought to be ploughed as soon as possible after the crop is off harrow in a couple of weeks and again as required to kill the weeds. (1) In spring following plough, and when dry, harrow. In the meantime the manure must be turned over to allow of heating sufficient to kill the weed-seeds, care being taken of firefang. When ready to sow, harrow on a dry day, and manure a strip lengthways of the field, put on more than you think necessary, turnips always repay the feed you give them.

Unless very evenly spread, run over it with the horse-rake.

Now as to making the drills. Oh yes, everyone knows how to make drills, but this is written for those who do not raise roots, because they do not know the simple way of doing it, and if there are those who know better, we hope to hear from them. Commence on the left hand side of the field and draw a light score, (you can commence work on the right hand side of the field by starting from the farther end). If your furrow is not straight, drive back and amend it. Now change the whiffle-tree clevis from the centre towards the end of the plough clevis nearest the near horse to suit making a nice drill. (this will depend on the lengths of the whiffle-tree and clevis).

Drive the off-horse back close by the edge of the furrow, and don't score too deep. There is now one drill made. Now (having provided a long, loose clevis bolt) change the whiffle tree clevis to the end of the plough clevis nearest the off horse, to allow the plough to follow the near horse in the score just made. Look away ahead between the horses and keep a straight score. With a common hand hay-rake take of the lumps and roughness from the drill. Use a stick about five feet long to draw the seed line, sow the seed, and again rake, roll lightly, (the best turnip land does not permit of rolling). These operations ought to be performed about half as fast as an easy walking pace. Sow evenings and mornings, when there is no wind, and immediately after the drills are made, they are then moist. As each strip is finished, proceed with another. In this way the work proceeds regularly, the turnips have an even start with the weeds, and the hoeing can be done without so much pressure. Formerly it was necessary, on account of the fly, to sow about the middle of June. In the late years however they do well in May. We will suppose that a turnip-seeder is not at hand, which is just as well for a small field.

If you have no experience in sowing measure the land, count the number of drills per acre, allow two lbs of seed per acre, calculate the quantity required for each drill, and after sowing a few drills in this way, there will be no difficulty.

It will be observed that I do not put the manure in the drill and cover it up, for the reason that when the manure is pushed into the drill with the plough, it is ready for the immediate use of the plant. The usual method of placing it in the drill makes more labour, and it is several inches from the seed. A neighbour says, 'but if the manure is full of creed-seeds the deeper it is the better.' Stop reader! If your manure is seedy. 'Don't sow roots'

Trenholmville, April 1896.

JAMES DICKSON.

(Continued next issue.)

(1) Cannot agree with loamy soil lying all the winter in a harrowed filth.—Ed.

FEEDING MILK COWS.

First prize, Prov. Ex. '95—Pease, hay, oats—cake—three feeds a day—bran not too dear now—tares and oats—8 lbs. meal a day.

To feed milk cows so as to return a profit, it is necessary you should have good ones, as the cost of feeding is the same. A good cow well fed will return you a good profit but a poor milker makes no profit, which ever way you feed her. I kept a herd of about forty head young and old: Registered Ayrshires and high grade Ayrshires. The pure breds are the best milkers for the year round though I have grades that will milk more for a time but won't keep it up so long. I will give you in detail how I fed my own cows last winter and I never fed a ration that gave better results for the money I may say that my corn ensilage was extra good last year, being full of ears. As near as I could make it, each cow got 25 lbs ensilage 4 lbs cut hay 4 lbs ground peas and oats, and 2 lbs ground oil cakes, all mixed together and wetted a little. I mix in a large box that holds enough for a full feed and mixing at night for morning feed and in the evening for next morning's meals. This quantity I gave in two feeds, at 5 a. m. and 5 p.m., and a feed of long hay at noon. This is not heavy feeding, but I think enough for breeding cows. I do not now believe in trying to make milk and beef, at the same time, as I found it does not pay to do so. Always use clover as long as it lasts. I find it better than timothy hay, but when timothy is cut on the green side, it makes good feed as well as clover. Dry cows and young stock I give two feeds of ensilage or roots and give them more ensilage than I give the milking cattle with a midday feed of hay. I varied the feed of the milk cows by occasionally substituting mangels for the ensilage, I fed the mangels by themselves whole. I believe in keeping cows well curried and brushed (they should be groomed as regularly as horses) as well as feeding them right, and any who use the curry comb and brush well will easily save a pound or more of meal per day. I like bran well but could not afford to feed it last year at $18.00 to $20.00 per ton and ground peas and oats and oil meal $25.00 or $26.00 per ton.

When bran is $13.00 or $14.00 then it pays well to feed it. Pastures generally get short towards the end of July and farmers should have some green food to give milch cows then, I always make three sowings of tares and oats, the first as early as possible, so as to have a couple of months feeding when pastures are bared. After the tares and oats are finished corn is well eared

and makes good feed. Prune the stalks through the cutter and mix with oil meal and cotton seed meal at the rate of 2 lbs per cow per day for one feed and give as much corn as they will eat up clean, and never cut corn till it is cared, if I can help it. I always use cut straw for bedding and find the cows are easier kept clean and it absorbs the urine perfectly. I find no profit in having more pasture than an acre per cow and in my own case I have less. When a dry time comes the grass burns up and it makes but little difference if you even had three acres per cow. In winter I water twice a day using water that has been in the stable day and each cow watered separately. It is very handy to have water flowing in front of cows all the time, but when we hear so much about tuberculosis it should make farmers careful as by having the water flowing in front of all your stock, if you happen to get one diseased cow she might very easily give the disease to the whole herd. The stable should be well lighted, tightly built, but easily ventilated. Never use bales to tie up with, use chains and two cows in a stall. Stalls five and a half feet wide and seven feet long are about the proper size and I find it best to feed off the ground instead of feeding boxes. Boxes or troughs are difficult to keep clean and sweet. Never leave a door open in winter that might cause a draught and by regulating the ventilation you can keep the temperature at 60 to 65 degrees which is about the right heat for milch cows. Young stock don't need to be so warm. Though I mention the ration that I actually fed last winter, in another year I might change, if some other foods were cheaper than in past, Ground barley or corn might be substituted for oats, and other foods such as sugar-beet pulp produce milk cheaply when fed with ground grain. The most important point is to use food that will produce the most good milk for the least money and I find it very easy to feed too much meal,to produce milk profitably.

For cows weighing from 900 to 1100 lbs 6 to 8 lbs meal is enough, 25 to 40 lbs ensilage and 10 to 15 lbs hay; when you give more meal, you get more milk but not enough more to pay the extra feed. I suppose Shorthorns, Holsteins or other very heavy cows will consume more food than Ayrshires, Guernseys or Jerseys and in every herd there are cows that are bigger eaters than others and they should get extra food. One thing I have noticed since I commenced feeding oil meal is that I have never had a cow with indigestion or going off her feed. Cotton seed meal has been blamed for producing abortion but it has never had this effect in my herd and when cheap enough is a profitable food. There are a few points in looking after milk cows which I will give. Keep your cows in good fresh condition when milking and when you notice a cow getting too thin by heavy milking or otherwise, feed her extra, it never pays summer or winter to let cows get too thin. Quiet handling and grooming, regular feeding time and regular milking time. Whatever sort of meal you feed you will certainly get more profit out of it if you feed along with it well matured corn-silage or mangels and I feed both. I have quite a large entry of stock for the Exhibition and I would like if the gentlemen who are judging the Essays would come and look at them, the stock will speak for themselves.

DUNCAN McLACHLAN.
Petite Côte.

HARRY SMITH, SOUTH DURHAM COUNTY, QUEBEC.

Second prize Prov. Ex. '95—Butter making—Cleanliness—ripening—starters—churning—salting.

In making butter the first great thing to be observed is the most scrupulous cleanliess in all departments. This should begin with the milkers and in the care of the milk, and be continued and fully carried out in the factory. Besides thoroughly washing and scalding all utensils and carefully straining the milk, it should be kept in a pure air free from all objectionable odors. In the separating of the milk three processes are in general use, deep setting, shallow pans and centrifugal force As the latter is undoubtedly the best in every way and the one in most common use in factories it is the one I will deal with. The milk having been received in good order and free from taint it should next be warmed to 80o or 85o Far. for separating, and should be run through the machine at such a rate as to obtain cream of a high per cent of fat (not less that 25 per cent and as high as 30 or 35 per cent by Babcock test will not be found too thick) The advantages of rich cream are many and important as it enables us to churn at a much lower temperature which gives more exhaustive churning; butter with less foreign elements in it and of better keeping qualities and that will require less washing which is of a great advantage as the use of more water than necessary tend to spoil the delicate flavor of the butter. After separating the cream from the milk the cream should be cooled down to a temparature of 45o Far., as this will give a better grain to the butter. After holding at this temperature for an hour or so, it should be warmed to about 60o to 64o Far., to ripen. The ripening temperature will vary according to the condition of the cream and the length of time in which is to be allowed to ripen. If it is in an advanced condition when set, low temp. should be used and if very sweet a higher temp., and if necessary to ripen in the required time a little good flavored starter may be added. For fall and winter the use of a starter will be found almost indispensable if obliged to churn every day, but starters should never be used unless of really first class flavor. When the cream is ripe it will be of a bright glossy mirror-like appearance and of the consistency of thick syrup. If allowed to get over ripe it will loose this bright appearance and there will be danger of great loss in the butter-milk. When ripe, cool to a tem., of 50o to 54o and then strain into the churn in order to take out all curdy matter, butter that may have been churned in separating and any dirt in the cream. The temp., of the churning-room should be about the same as that of the cream or the cream will warm very rapidly during churning which should take from 30 to 45 mins. Stop the churn when the butter begins to "break" and add about 10 per cent of very cold water as this will give a butter-milk. Churn again until granules are about half the size of a grain les are about half the size of a grain of wheat and then draw off the butter-milk after allowing the churn to stand a minute or two for the butter to float. Wash with water at 48o to 50o Farh. and if the water does not come away clear enough wash again and especially for butter that is intended for keeping. For immediate consumption once washing will be found sufficient as a rule. Salt, to suit the trade, with from ½ to 1 oz. salt per lb. of butter. Work until the salt is all thoroughly mixed and the butter has a firm waxy appearance being very careful to avoid overworking as this gives the butter a greasy, salvy appearance. If color is found necessary to suit the customers it should be put in the cream before starting the churn, and quantity should be from 1 to 4 drs. per 1000 lbs. of milk according to season.

As I have advised the use of a starter when necessary, I give an outline of the plan of making a starter that gives good satisfaction. Get milk of the very best flavor, and quantity according to the amount of cream to be ripened. Warm it up to about 90o Farh. and then set aside to sour. Watch closely for it changing, and as soon as sour, add water of same temp. as milk and about one gallon of water to three of milk. Set aside again and avoid disturbing it until wanted for use. When wanted, pour from one pail to another until smooth and of the appearance of butter milk. Use from 2 to 12 per cent of this according to the temp. and condition of cream and time required to ripen it.

SEED TIME.

Change of seed—preparation of land—covering seed—dibblers—drills—steeps.

"Summer and winter, seed-time and harvest, shall not fail." When this reaches the readers of the "Journal" the time for sowing will be again upon us, and what an important season. How careful the farmer must be to see that all the conditions to secure a good harvest are observed as far as he is concerned:—First as to the quality and kind of seed he selects. It is highly important to deal with a seedsman of known reliability as to care in the execution of orders, and selling pure and genuine seeds of the varieties stated Then to study well what have proved the most suitable to the soil, climate and locality; and to plant only such. Occasionally changing the seed, must claim our attention. Seed sown year after year in the same soil deteriorates as to vigour and productiveness in same such manner as animals by in-breeding. It is advisable too, if you have diffferent qualities of land, to sow that on heavy land which has been grown on light and "vice-versa." But at intervals the seed should be procured from a totally diffferent soil and atmosphere. Seed grown in a warm, early locality is in some measure constitutionally changed and will mature earlier, for some years at least, when transferred to a colder and later one and the yield will for some time be greatly increased. The new varieties of grain will not be so likely to suffer from blight for the reason that they are more vigorous. As a proof of this it is an historical fact that the crops in great Britain, just 100 years ago (1796) were badly blighted; but one enterprising farmer a Mr. Knight had raised some wheat of new varieties by planting the various kinds together and these escaped, even when sown in different soils and localities.

The preparation of the land next claims attention; it must be well drained, well manured, and in "good heart", well ploughed, rolled, harrowed, and everything done to make the seed bed level and of uniform depth so that the seeds may come up all at the same time.

Again the proper condition must be observed as to dryness. It is an old axiom that seeds "love a dry bed" (1) that is to say, of the proper degree of dryness or moisture, not too wet. To sow during or immediately after rain especially on retentive soils is a fatal mistake, for in such a case seeds falling into deep places where water would stagnate would perish or produce, at the best puny growths.

Again, how carefully should seed be covered: not pressed into the earth too firmly, but enough so to enable it to take hold when it begins to germinate.

To shows the necessity of doing all we can to favour germination and subsequent growth, we will notice a few points connected with this delicate and wonderful process. When seeds are deposited in the earth under favorable conditions, germination commences, or in other words the vital energies are set in action, and the life of the plant is begun. This does not depend upon any chemical change which takes place in the soil, which is then merely a vehicle by means of which a due supply of air, moisture, and warmth is steadily kept up until the growing plant is formed. The change takes place in the seed itself. The latent principle of life, albumen, contained in the kernel or cotyledon when exposed to the necessary temperature and moisture becomes active, and the result is that, first the "radicle" is send down to form the rest and the "plumule" to form the stem is sent up. If either of these is damaged or decayed, the embryo plant must perish before life has fairly begun except in the case of a few forest trees, the seeds of which are sufficiently charged with albumen to replace a lost radicle or plumule. This shows the necessity for the soil being in such a condition as to warmth and moisture as to favour the healtly germination of the grain planted therein. Now, a seed falling too near the surface will encounter too much air and consequent lack of moisture, while one planted too deep will have too much, for the want of air to cause evaporation, hence the necessity to plant seed at such a depth that the medium between these two conditions will be secured.

If the land is badly ploughed and the seed-bed of unequal thickness some spots will be moist while others are dry, and thus germination will be, at the best, irregular, and in some cases impossible; for, if those seeds in the deep soil are not decayed they will be longer in coming up than the others and the crop will neither grow nor ripen uniformly. The drill is therefore as a rule to be preferred to broadcast sowing, because the seeds are more likely to be deposited at a uniform depth and equal distance apart. It is a curious fact that the farmers of antiquity dibbled or drilled in their seed, but it was not until the middle of the seventeenth century that any attempt was made at drilling in Europe. About that time a

(1) Except fall-wheat and horse-beans, neither of which is particular about its couch.—Ed.

Mr. Platte, made a dibbling machine of the rudest description; next, a sowing machine called a "Sembrador" was invented, it followed the plough and dropped the seed into the furrow, but was of no practical use. Now we have sowing machines for all sorts of seeds and grain and look upon them as necessary.

The accelerating germination of some seeds can be effected by applications or heat and moisture before sowing, and in some cases it is worth while to do this Pease, Indian corn and the like will germinate much quicker after planting, if soaked previously in a little tepid water but care must be taken that they are not left too long in it for if so the vitality of the seed will be destroyed instead of assisted.

Some seeds can be protected from the attack of insects, worms, mice and other depredators by steeping them in liquids with offensive odours which will not injure the seed. Diseases which are caused by fungi can be checked, as for instance, the rust in wheat, by steeping in Bordeaux mixture before sowing the seed, and the scab in potatoes by steeping the sets in diluted acids. Wild assertions have been made that seeds could be doctored by steeping in various fertilising elements to render them more productive, but this is all nonsense. A plant must derive its nourishment from the food contained in the soil while it is growing, just as an animals lives upon the food taken into the stomach.

It will be well for the farmer to bear in mind that the words of Holy wirt have a literal and practical meaning as well as a metaphorical one."Whatsoever a man soweth that shall he also reap."

GEO. MOORE.

APPLICATION OF THE X RAYS IN AGRICULTURE.

What is probably the first application of Röntgen's rays of the elucidation of an agricultural problem has been effected at Munich by Dr Graetz, who has obtained by the agency of the X rays the "photograph" of a pig one day old. The outline of the skeletal system is clearly shown, and an illustration of it is given in the "Journal d'Agriculture Pratique. M. Grandeau, in an article on the subject, directs attention to the value of the process in adding to our information on the development of osseous structures up to the time of birth—knowledge such as could only previously be acquired by laborious and protracted dissection. The "long" bones, in particular, show how ossification begins at several points simultaneously, and gradually extends by the accumulation of mineral salts, notably phosphate of lime, in the gelatinous framework. An examination of the image of the skeleton of this young pig makes much more intelligible than would a long dissertation the necessity of a diet rich in phosphatic matter, and its effect upon the perfect development of the osseous system. As Mr Grandeau points out, the young animal, of which the bony tissues are so imperfectly constituted at the time of birth, finds in the maternal milk the nitrogenous and phosphatic ingredients essential to the formation of bone.After it is weaned, such food as is afforded in cereal grains furnishes it with the phosphoric acid, the lime, and the magnesia required for the completion of its osseous structures. In the solution of many problems which still remain to be attacked in the domain of animal nutrition the application of the new method promises to be fruitful in results, whilst its value in affording a means of verifying conclusions, which are already regarded as established must be apparent to all who have engaged in the study of this branch of animal physiology.

JAMES LONG,

(Author of "British Dairy Farming," &c.)

ON

POTATO CULTIVATION

Experiment crops—manures—dung vs. artificials—spraying—potash.

The time has arrived when growers of potatoes are commencing their work for the current year, and although prices have been, and still are, so bad that the crop is hardly worth growing, it is, nevertheless, a maxim to stick to the crop and to take the good seasons with the bad. Last year, owing to the severity of the weather in a great measure, those who preserved their potatoes with care reaped large prices; this year owing to the abnormally mild winter, the prices have been continually low until this popular food of man has been reduced to a price which represents its value as food for cattle. In the Wiltshire potato growing experiments in the two past years crops of extremely heavy weights were obtained, in some instances 20 tons to the acre. In the past year the experts of the agricultural department of the Reading College carried out some potato growing experiments in Berkshire, Hampshire, and Oxford, and it will be instructive, affording an excellent practical lesson to growers, if we refer briefly to the results which were obtained. In the first series of experiments on gravelly loam, which gradually emerges into a clay subsoil, potatoes were grown in the field in 1893, and cabbages in 1894. In 1895 the crop was grown under six different systems of manuring, in the first case 20 tons of farmyard manure being used alone per acre. This quantity of dung was also used in every other case, but in addition, on No. 2 plot, 1 cwt. of sulphate of ammonia, 2 cwt. of superphosphate, and 2 cwt. of sulphate of potash, were given; on No. 3 plot, 1 cwt. of sulphate of ammonia, and 2 cwt. of superphosphate; on No. 4 plot, 1 cwt. of sulphate of ammonia and 2 cwt. of sulphate of potash; on No.5 plot, 2 cwt. of superphosphate and 2 cwt. of sulphate of potash were used; while No. 6 plot was manured the same as No. 2, with the addition of 2 cwt. of common salt. The best yield was obtained on No. 2 plot, viz., 13 tons, 19 cwt., or 2 tons, 9 cwt. more than where dung was used alone. In all other cases the crop weighed between 12 and 13 tons. The extra two tons and a half or thereabouts were obtained at the cost of 29s. 6d. for the manure, but in no other case was the extra yield so considerable as might be expected, perhaps owing to the heavy dressing of farmyard manure given. On another farm, loam resting on a loamy subsoil overlying gravel, there were seven plots in the experiment, the first being without manure, the second with 15 tons of dung, and the third with 15 tons of dung and a heavy dressing of sulphate of ammonia, superphosphate and sulphate of potash, while the other four dressings included these three manures in combination, or partly in combination. The result was much more surprising than in the last experiment. Without manure, the

WEIGHT OF SOUND TUBERS

on the portion which had been sprayed to prevent disease, was only four tons—we leave out the odd cwts. Dung alone gave nine tons, while dung and three other artificials gave nine tons or half a ton less than where the three artificials were used alone. Again when two artificials were used—potash being omitted—the weight was increased to 10½ tons; (1) then curiously, where sulphate of ammonia and potash were used without superphosphate, only 4½ tons were obtained; omitting the sulphate of ammonia and adding superphosphate to potash the weight was increased to 8½ tons. This soil was clearly rich in nitrogen, hence the fact that it did not respond so liberally to the sulphate of ammonia as to the superphosphate which appears to be the one manure which it requires. The experiment is therefore of double value, but additional value is given to it because part of the crop was sprayed with the well-known mixture of sulphate of copper and lime, with the result that the actual weight of sound tubers obtained on the land which was not sprayed was considerably smaller than the other. The plot without manure, for example, gave only one ton, 17 cwt. of good tubers, and the dunged plot only six tons and a half, or four tons less than the sprayed land, but where the artificials were used the diminution in the weight was considerably less, suggesting that dung assists or promotes the growth of the disease fungus which equally obtains the upper land on land which has not been manured at all. On a good loam soil about two feet thick and resting on chalk, 9¾ tons of good tubers were obtained on sprayed land, and 4½ tons where the growth was not sprayed without manure; these yields were increased to 10 tons on sprayed land and 6½ not sprayed, where the manure used was 1 cwt. of sulphate of ammonia, 2 cwt. superphosphate, and 2 cwt. of sulphate of potash. The addition of 15 tons of dung for the same artificials gave an additional 25 cwt. of good tubers—where the crop was not sprayed—not a considerable increase. We not a considerable increase. We make one more reference to the potato experiment, and in this case to crops grown on a light gravelly soil with a sharp gravel subsoil. There were nine plots in all; without manure the total weight of tubers was 8 tons, with 15 tons of dung it reached nearly 10 tons, with 15 tons of dung and 1 cwt. of sulphate of ammonia and 2 cwt. each of superphosphate and sulphate of potash 10 tons were obtained; with the same artificials without the dung 8½ tons: with the artificials without potash 6½ tons; (2) with the same without superphosphate 8¾ tons; with the phosphates and potash alone 9 tons; with phosphates alone 8½ tons; and with nitrate of soda and phosphate 9½ tons; here nitrate was much more successful than sulphate of ammonia, although this is accounted for by a gravelly vein of soil. The heavy manuring of previous years accounts for the good crop on the unmanured land, and perhaps also for the fact that the artificials and dung used did not give a more important increase. These experiments convey a most excellent lesson. It is clear that the heavy manuring of soil in high condition may not be attended with economical results; that the expensive manuring with mixtures of artificials or of artificials and dung, may be equally costly, if the actual requirements of the soil are not understood; and that, consequently, no first-class result must be expected unless the grower obtains accurate knowledge by the systematic conduct of simple tests.

(1) Curious all this, and worth attention.—Ed.

(2) Here, the light gravel was poor in available potash; in the heavier loam there was, as there almost invariably is in decently farmed land, plenty of potash.—Ed.

The Poultry-Yard.

Winter and Summer prices—What are our farmers doing to supply the home winter market—New laid eggs with superior flavor wanted for midsummer markets — The superior article ought to get a superior price.

(A. G. GILBERT.)

In my last article I promised to say something about the markets for new laid eggs and poultry open to our farmers. What do the farmers in the neighborhood of Montreal think of 40 and 45 cents per dozen for new-laid eggs during November, December, January and the greater portion of February? And yet that price is regularly paid by first rate family grocers in Montreal, during the months named, to farmers who supply them with the strictly new-laid egg! I have the letters from the grocers in question to prove my statements. More, I read them to the members of the Agricultural and Colonosation Committee of the House of Commons, when I appeared before them, on the 10th of March last, to give my evidence, as to the work accomplished during the past year in my department.

ARE THE PRICES QUOTED INDUCEMENT ENOUGH?

I want to ask the farmers in the Province of Quebec the simple question, are the figures quoted viz: 40 to 45 cents per dozen for new-laid eggs in winter, enough to induce them to attempt the getting of the eggs wherewith to reap the reward?

And not only is there a good winter market for new-laid eggs, but there is also a demand for new-laid eggs of superior flavor in the summer months, As it is, there is no guarantee to the purchaser, that the eggs he buys in midsummer are not so stale, as to be almost uneatable. As a matter of fact the great majority of eggs sold after the first summer month, by dealers or farmers, are unreliable articles. How such a state of affairs is brought about has been described at length in previous numbers of the "Journal of Agriculture." And it will so continue to be until the farmers make it a rule to keep the male bird separate from his laying stock; to collect the eggs laid once or twice per day; and to put them on the market as quickly as possible. If they have to be kept for a few days, care should be taken to have them kept meanwhile in a cool sweet smelling cellar, or store room. It has been before stated to the readers of this jour-

nal that the flavor of the egg will be affected, if placed in unclean surroundings.

In winter, there is not so much danger of new-laid eggs reaching the market with a bad flavor as there is in the hot mid-summer months. The farmer who will bring to his customer in summer, a superior article in the shape of non-fertilised, new-laid eggs of unimpaired flavor, is worthy of a better price than that of the ordinary market, and he will no doubt receive it. There are few purchasers who would not rather pay a few cents per dozen more for a reliable article, than buy the uncertain article at the ordinary price.

FINELY FLAVORED EGGS WILL BRING A BETTER PRICE.

Now to prove what I say. After delivering an address at Packenham, Ont, a ear ago last March—in which address I dwelt on the points mentioned above—, a farmer came to me and asked if I could get him a customer in Ottawa, who would give a good price for non-fertilised, new-laid eggs during the summer months? I said, "Certainly, and when you come to Ottawa call on me and I will introduce you to one." He came and I introduce him, by name Wm. McArthur, to Mr. N. Bate, of the firm of Messrs H. N. Bate and Coy. well known family grocers, and who had a superior class of customers. I made the introduction in the following manner.

"Mr. Bate, you have a superior class of customers, I believe, whom you supply with a superior class of goods?"

"Yes" he said.

"Well," I continued, allow me to introduce to you Mr. Wm. McArthur, of Packenham, who can supply you with a superior article in the shape of new laid, non-fertilised eggs for your summer trade."

"I am glad to see you Mr. McArthur," said Mr. Bate "Now" said I, "I will leave you to make your own arrangements but allow me to say Mr. Bate, that if Mr. McArthur has the superior article and so proves it to your satisfaction, I think he ought to receive a better price than that you pay for what you cannot rely on."

So I left them and at the end of the summer season Mr. McArthur wrote me, that he had received 16 cents per dozen from Messrs Bate & Co'y., for the eggs he had sent them, being actually from 4 to 5 cents over the market price. And who will now say that reliable eggs will not bring a better price than the uncertain article? And as with eggs, so will it be with poultry; the well dressed choice birds "will bring" better prices than the miserable half starved carcases so often put on the market.

DO THE PURCHASERS REQUIRE A LITTLE EDUCATION?

Perhaps they do. A farmer once said to me "If we produce the superior article in eggs and poultry, you will have to educate the people who buy from us, for they are always beating us down in price." In retaliation, the farmer should try and pick out good customers for his choice poultry. There are always such customers to be found. And if the production of the best costs more, it will not be in over abundant supply at any time, so that the chronic beaters down-in-price will have no choice but from the average at the best. But I would like to see the best the rule and not the opposite. The aim should be to so reduce the cost of production that eggs in winter and choice poultry in season, shall be within the reach of the great mass of toilers. But the subject is too large to be discussed at present.

Menawhile, the farmers who bring in finely flavored, new-laid summer-eggs to Montreal, or any other city, will find enterprising grocers who will be glad to get a reliable article to fill the demand for such goods from their customers.

AN OMISSION SUPPLIED

I see that I omitted in my last letter the word oatmeal after granulated, in my description of the proper food for newly hatched chickens. You kindly supplied the missing link with "Oats," which filled the bill exactly. There is no better food for young chicks than granulated oat-meal fed raw, or rolled oats. The latter is apt to be expensive.

The chicks, while young and tender, require and care deserving of care. After 3 or 5 weeks their food cannot be too cheap and wholesome.

Ottawa, 13th April, 1896.

Correspondence.

Editor, "Journal of Agriculture:"—I have recently noticed your comment on the value of wood ashes as a fertilizer, in my article on "Climate and Fertilizers" in your issue of January 1st. You ask for a credit for the small quantity of phosphoric acid in wood ashes. This phosphoric acid is not in an available form, and though the experiment stations value it at two cents per pound, the fertilizer trade place no value on it.

It would possibly become useful in time, but modern manuring methods would consider it valueless. It depends merely upon a mechanical distribution in the soil, and as an application of ten tons of ashes per acre (say 600 pounds of phosphoric acid) would mean a mechanical distribution in about 2000 tons of top soil—about five ounces of phosphoric acid per ton—it is readily perceived that a thorough intermixture is practically impossible. The efficiency of water solubility is largely due to the thorough intermixture effected by the soil waters.

In this connection it will be well to state that a very considerable proportion of the potash in wood ashes as we receive them in this country, is insoluble in water and therefore of very little agricultural value. Another point or disadvantage is the high content of carbonate of lime, which is very injurious from its tendency to increase the scab disease of potatoes and beets. In fact, the potash itself is largely in the form of carbonate. In this country, and no doubt in every other for that matter, the crude potash salts are really much the cheapest form of potash manure from several points of consideration.

S. PEACOCK,
Philadelphia.

Box 2068, Sta. A.,
Philadelphia, Pa.

We sent the above letter to Professor Shutt, and his answer is as follows:

Ottawa, April, 6th., 1896.

Arthur R. Jenner Fust, Esq.,
4, Lincoln Ave.,
Montreal.

Dear Sir:

I am in receipt of your communication of the 31st ult respecting wood ashes, and beg to reply as follows:

There can be no doubt as to the high value and great efficiency of wood ashes as a potassic manure. The testimony of all practical farmers and horticulturists who have tried wood ashes is in their favour and at this date it would be altogether unnecessary to bring forward evidence in support of the widespread belief that the plant food elements they contain chiefly potash are readily assimilated by crops.

It is quite true that a part of the potash and phosphoric acid in wood ashes is not immediately soluble in water. Such, however, is undoubtedly for the most part soluble in the acid exudations of plant rootlets, which secretion, as lately shown by Dr. Bernard Dyer, has a solvent action equal to a one per cent. solution of citric acid. The prompt results that follow an application of wood ashes abundantly corroborate this assumption.

It should not be forgetten that though potasl is the chief element of value in wood ashes it is not the only one. They contain in notably quantities lime, phosphoric acid, magnesia and other mineral constituents of plants. The significance of this statement is apparent when we remember that leached ashes containing but a trace of potash have a marked effect upon crops. Again, for many soils the alkalinity of wood ashes gives this fertilizer an additional value.

It is interesting to note that agricultural chemists have lately assigned greater value to reverted phosphoric acid than has been the practice hitherto. Forms of phosphoric acid, potash and other fertilizing constituents not immediately soluble in water, but soluble in a solution of an acidity equivalent to that of root sap have been shown by practical experiments to be available for plant use with almost the same rapidity as the water soluble forms.

Respecting the action of lime in its tendency to increase the scab in potatoes: it is true that some experimental work done in the United States appears to prove that such is the case. Whether it be so or not the agricultural value of lime for all other crops is unaffected. We have scientific evidence to show that all fertile soils contain notable quantities of lime, and also the practical testimony of experienced farmers as to the beneficial results from an application of lime in some form or other to soils deficient in this element. It will not perhaps, be necessary for me on the present occasion to speak in detail of the well known agricultural functions of lime. I beg to send you herewith a copy of our report for 1889, in which on page 49 you will find a short article written by me on the subject of wood ashes, together with several analyses of Canadian samples.

Yours faithfully,
FRANK T. SHUTT,
Chemist, Expl. Farms.

WOOD-ASHES.

(BY PROF. SHUTT.)

Materials of plant food—potash—alkalinity of ashes—light soils—sale of ashes.

Of the three materials indispensable for plant growth—nitrogen, phosphoric acid and potash—Canada finds within her own bounds ample supplies of the two latter in the vast phosphatic deposits of Ontario and Quebec, and in the wood-ashes produced in the clearing up of new country, while nitrogen is supplied by the swamp and marsh mucks already referred to.

Wood-ashes are the mineral or inorganic constituents of plants which they, during their growth, have absorbed from the earth. If, therefore, we return to the soil such ashes, we are supplying future crops with the mineral food necessary for their development in the proportions that they require for the building up of their tissues.

The essential fertilising ingredient of wood-ashes is potash—the secondary elements of value being lime and phosphoric acid. The crops specially benefited by an application of potash, are clover, pease and other leguminous plants, potatoes, cabbages, beets and other leafy plants. Hence it is that wood-ashes are strongly recommended for these crops.

On account of the alkalinity of wood-ashes their use is also recommended for making composts with black muck and such like substances, for by this treatment the nitrogen of the latter is set free in a form readily assimilable by plants. Thus it is that wood-ashes act both directly and indirectly as a fertiliser. By their use the tilth of sandy soils may be much improved, for by virtue of their contained potash the particles of the soil become more closely, cemented thus ensuring a greater retention of moisture.

As a potash fertiliser, wood-ashes in Canada take a front rank, yet it seems necessary to impress the value of their use for home consumption upon our agriculturists. Canadian ashes are sold and eagerly bought in the New England States for three times the price they can be purchased for in the home market. Notwithstanding this fact, the sale of ashes for agricultural purposes in Canada is very limited. It is to the lighter soils, in the older sections of this country, where cultivation for many years has exhausted considerably the original store of potash, that the benefit from a dressing of wood-ashes will be reaped.

BUTTER PACKAGES.

Boxes vs. barrels—weekly shipments—Liverpool prices.

April, 10th, '96.

SIR

My recent visit to England confirms me in the opinion that the square box is the favorite package, and that all our Creameries should adopt it at once. A certain quantity of Butter will be required in casks (or kegs), but the 70 and 50 lb. tubs are not looked upon with favor in England. Great care should be used to thoroughly soak or steam the wood, and to carefully pack the Butter in parchment paper. It might be well to wet the parchment paper slightly and to sprinkle a little salt on it before packing the Butter, so as to produce a brine or pickle, and thus prevent mould gathering on the Butter. All Creameries should ship the Butter weekly to Montreal, where it can be kept frozen until ready to ship. As far as possible all Butter should be sold and shipped fresh to Great Britain. Use less salt than in former seasons and keep the salt away from fish or oils.

In a recent communication in your paper, I note that a gentleman who is seeking for consignments to his firm, (1) makes the assertion that Butter sells

(1) This refers, probably, to "An interview, etc," v. p. 321, April No. '96.—Ed.

for 1 cent more in Liverpool than in other markets. How strange that the Butter merchants of Montreal have not found this out, and that the bulk goes to other markets. If he had said that as a rule our Canadian Butter sold at 1 to 5 cents less in Liverpool, he would have come nearer the mark.

It is to be hoped that Liverpool will return to her former liking for Canadian Butter, and give us an opportunity of shipping to that market on equal terms with others. It was found last year, it did not pay the steamers to put on refrigerator compartments for that port. Let us hope that the demand will be better this year.

A. A. AYER.

Lancaster, Ont., April 10th 1896.

Editor of "Journal of Agriculture,"

Value of silage—silos—last summer's crops—roots—farming a profession.

DEAR SIR,

I am duly in receipt of your post-card, about Ensilage, and would say that I have not given up the use of Ensilage nor have I any reason to do so; but on the contrary my favourable opinion of the benefits received from its growth and use are on the increase, so much so that I am now convinced that no farmer can afford to be without a large use of this very valuable cattle food.

For the sake of confirming the above conclusion by actual results, permit me to relate to you some of the effects on my present home farm, which has been cultivated mainly for the past six years to test the working of Ensilage as a cattle food.

Seven years ago this farm was much run out by overcropping and poor crops, and no profit was the result of working it. The farm consists of 120 acres of arable land, soil is light and sandy, with sandy bottom; it would only keep, 20 milch cows and a few young cattle the year round, and the total crop value on the average of five years would not be over one thousand dollars and the cash sales therefrom about five to six hundred.

I introduced the Ensilage system on a large scale having silo capacity of 800 to 900 tons and have filled them nearly every year for the past five years, and I was able the past two years to pasture 70 or 80 milk cows on 35 acres of pasture, unassisted, until grass after from meadows' and no supplemental feed given them until October. I have also pastured 65 pigs, and grew enough of coarse feed such as corn and hay besides, to feed 148 heads all winter: 70 milch cows, 72 fat steers and six horses The inventory of last summer's crop is as follows, 900 tons corn from 30 acres, 110 tons hay from 35 acres, 800 bus., barley and oats 18 acres, 250,000 lbs of milk from 35 acres 13,000 lbs of pork, 2 acres (N.B. there was additional purchased food for pork production $160,00) veal sold $180.00 worth. The above crop value is fully over five thousand dollars, and there will be sold in cash sales from the above, about $3500.00. This result of increase crop value is somewhat to be credited to the Ensilage but not all.

As to the raising of roots for feeding. I have no prejudice against it, but all praise and approval. The one principle that should guide all farmers in those matters is this: where a farmer has a good root house and good convenience and skill to raise roots then by all means stick to roots; if a farmer has a silo and good skill in making and raising corn-crops, then by all means stick to corn &c., &c. Each man must study his own convenience and skill and make the most profit from these. Farming is purely and simply a business profession, and the farmer who can expect to make a profit must study business principles and be a good, first class, business man.

I should be please to have you come up and visit my stables and farm this month and show you an object lesson of the facts herein stated.

Yours very truly,
D. M. MACPHERSON.

Côte St. Michel, April 7, 1896.

The Editor of the "Journal of Agriculture."

DEAR SIR,

Can you suggest anything that would prevent crows from scratching up and eating corn when newly planted in spring? Would the following be injurious to the corn? To steep it a short time in water in which tar is dissolved, then to sprinkle it with land plaster and plant immediately.

Do you think it would prevent crows from eating it? I have been asked this question several times, both by French and Old-Countrymen. An answer in both the French and English paper will greatly oblige.

An Old Subscriber,
GEO. BUCHANAN.

ANSWER.—The treatment Mr. Buchanan speaks of is the one we have always seen used, and it seems to be generally efficacious. As we have never been pestered with crows on any land we farmed, we cannot speak from practical experience.—Ed.

Notes by the Way.

SACALINE.—We shall have to rest satisfied with the good old forage plants. Sacaline is thoroughly, what our ancestors would call "blown upon," and must be relegated to the tomb of the No-goods. At the Nebraska Station, it seems to have had a fair trial, and the verdict is that it is useless for forage; a coarse weed; hardly more than three feet in height, the stems half an inch thick and woolly. The botanist of the State sent out warnings, last season to the people not "to waste their money in the purchase of seeds and roots of this "fraudulent forage-plant."

FOOD AND MILK-FAT.—We do not know where "Oak-Bluff" is, but Mr. Washte of that place finds that food does alter the quality of milk. "So long as the cows range on the higher ground they do well on grass alone; but, as that dries up, and they fall back on the swamps, "the milk becomes poorer," and he has to supplement what the cows pick up there with richer food, for which purpose he grows an acre or two of swedes and mangels." The mangels are hardly likely to enrich the milk, though the swedes would. White-Belgian carrots are better than either

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A JERSEY-SHORTHORN RECORD—A pretty violent cross, to be sure; we should prefer a Guernsey-shorthorn but in this instance it seems to have answered:

RECORD of a JERSEY-SHORTHORN—MILK, BUTTER, FEED.

ED. HOARD'S DAIRYMAN:—I see in Jan. 31 number a record of a four-year-old Guernsey and Jersey heifer, owned by C. L. Peck, and I have just started on a test of a four-year-old Jersey and Shorthorn. I thought I would give you the result. I have no separator or tester. The cream is raised the old style. Every thing was weighed and given in pounds. All feed was dry, not moistened. Test began Jan. 30th. and the yield was as follows:

January, 30	45¼	lbs milk
" 31	48¾	"
February 1	51¾	"
" 2	51¾	"
" 3	52	"
" 4	51¾	"
" 5	51½	"
Total	352¼	

Number pounds per hour, 2.1. Amount of butter churned, 18¼ pounds. Ration during test, 7 pounds clover hay, 6 pounds oat hay, 7 pounds bran, 4 pounds corn and meal, 2 pounds of meal old process, 6 pounds corn stover

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The ration given is thus tabulated by "Hoard."

	Organic Matter.	Digestible Nutrients. Protein.	Carbo-hydrates.	Fat.
7 lbs. clover hay	5.50	.46	2.44	.11
6 lbs. oat hay	5.09	.26	2.78	.09
6 lbs. corn stover	3.39	.12	2.00	.04
7 lbs. bran	5.77	.88	3.09	.20
4 lbs. corn & cob meal	3.34	.26	2.59	.12
2 lbs. oil meal	1.70	.57	.66	.14
Totals	24.79	2.55	13.56	.70

The observations, by the editor of the paper are worthy of attention:

But where did the more than two pounds per day of pure fat come from, when only 7-10 of a pound were eaten? There was no protein in the food to spare for this purpose. The casein and albumen in the milk, with no allowance for waste in the transformation, called for 1.75 pounds of the protein in the food and maintenance for .7 of a pound, and this leaves only one-tenth of a pound of protein to be accounted for. It seems impossible, therefore, to escape the conclusion that this cow must have drawn upon the reserve fat in her body for the excess of fat which she deposited in her milk. It is altogether probable that the cow lost in weight from day to day, not so much, perhaps, as to be perceptible to the eye, but if she should keep on at this rate for a month or two, the loss would be easily discernible.

Poor thing! How she would have fallen off in her looks, if she took all that fat daily from her reserve! Perhaps she had a secret reserve in one of her horns! any thing but the real thing, that she converted some of the carbo-hydrates into butter-fat, as any practical farmer would say at once.

But the upshot of the matter, now, seems to be this: if a cow is "well fed," the percentage of butter-fat cannot be increased by increasing the quality of food; nobody, that we ever heard of, ever said it could. What we, and all our friends, practical farmers in Britain, say, is this: that if a cow is fed, never so plentifully, on poor food, such as mangels, brewers' grains, and wheat straw, ten gallons of her milk will not make so much butter as if she were fed on good meadow-hay, Belgian or other carrots, crushed linseed, and pease-meal. If we only had a herd of cows how gladly would "we subject" the point to a practical test.

WHOLE vs CUT-POTATO SETS:—We thought this point was settled years ago, but a very sensible paragraph in the "Country Gentleman" shows that there are still some people who cut their seed. It is far better to plant whole sets, what we call "middlings'" in England, that is, potatoes about the size of a turkeys' egg. At Sorel, they used to keep the smallest of all—'chats"—but the consequence was that the crop became, less, year by year, and now they have learnt their lesson. The reasons given by the correspondent of the "Country Gentlemen" for using whole sets are very good:

"The reasons for using whole potatoes for planting are: The whole potato furnishes more nourishment to the young plant. The whole potato is less liable to rot if cold, wet wheather occurs It will endure considerably harder freezing of the ground before its vitality is injured. It will produce the first marketable tubers. It generally produces the largest crop. One year, the variation with us between whole potatoes and those cut to one eye was 100 bushels per acre. The whole potatoes that year produced at the rate of 300 bushels per acre, while those cut to one eye produced 200 bushels."

A BOLD MAN!—Now, here is a bold man who is evidently strong enough to stand on his own feet. In a letter to the "Dublin Farmer's Gazette," M. R. Gibson, a well known cow-keeper in Ireland, speaks as follows:

"The truth is, wherever the full facts with regard to feeding of milch cows have been published, they have either proved most unmistakably that feeding, and the manner of feeding, have a very marked effect on the quantity and quality of the milk, or the rations have been so absurdly wrong, from a milking point of view, that the results are worse than worthless; they are entirely misleading to those who have neither time nor knowledge sufficient to enable them to analyse the work of the experimenters.

If there are not men enough in England, Ireland and Scotland who are advocating this wild theory to accept my challenge, perhaps, now that "Hoard's Dairyman" is brought on the scene, some American may be foolhardy enough to take it up, so please permit me to say, I am still ready to pay all expenses of a public trial on sane business lines, under the management of any man, like Professor Carroll, of Glasnevin, or Mr. Smith, of the Munster Dairy School, if my statement is not fully proved correct; provided any one or number of persons will pay expenses if I am clearly proved correct.

My statement is that correct feeding properly given, "does" increase both quantity and "quality" of milk.

I go even farther and say that a simple ration of 2 pounds to 4 pounds decorticated cotton cake, given to each cow (according to her size) every day of the year, will increase both quantity and "quality" of any cow's milk to such an extent that it wil pay for itself at least three times over.

Anyone can test this by dividing into two a field that is fairly even in quality, and keeping what cows it can carry on each half, and feeding them both

with equal rations of hay in the winter, and giving to one set the decorticated cake ration.

If this experiment is carried out for two or three years, always keeping the cattle that get the decorticated cake to their own pasture, even the most confirmed sceptic will be unable to shut his eyes to the effect of feeding on milk both in quantity and quality."

R. GIBSON.

NORMAN CATTLE:—Some one was asking the other day about Norman cows, where they were to be found on this side of the Atlantic. We see, by our exchanges, that Mr. Theodore A. Havemeyer, of Mahwah, New-Jersey, has both Norman and Simmenthal cattle, for sale, but the price seems to be too high for any moderate purse, E. G., "Simmenthal bulls, one month old, $500, and Norman bulls, the same age, the same price!

WATER FOR SHEEP.—As we have often said before in this periodical, sheep can do very well without water when on succulent food such as good grass, rape or roots; in fact, except on the Downs, and other like arid pastures, we never saw a sheep drink in England. Here, in winter, with nothing but hay and straw, water is an absolutly necessary ailment. An incident that shows the wonderful power sheep have of living for a long time without water, is reported from Inverness-shire. About seven weeks ago, three sheep were missing from the farm of Balsparren, Arderser. Every effort was made to find them, but without success. A few days ago, however, a barley-stack was taken down and carried to the threshing-machine, and the poor things were found imprisoned in the wooden frame-work in the centre. They had lived for more than six weeks on barley alone!

The "frame-work" mentioned above is evidently the contrivance used in the damp climate of Scotland to admit a current of air into the interior of the late-harvested stacks of grain and pulse; indeed, North of the Clyde, especially on the West coast, pease are seldom stacked without one of these apparatus.

FALL IN PRICES.—The fall in prices during the last twenty years has been something unprecedented. We have seen this or that sell at low rates, but this fall has been over such a multitude of articles that one cannot appreciate it without concrete examples. The English Chamber of Agriculture has taken the task in hand of collecting statistics of the prices of one hundred different leading commodities from 1863 to 1895, with the following results: In 1873 the index number which represented the average price during ten years of 100 leading articles of consumption, such as wheat and other grain, meat, clothes boots and shoes, tea, sugar, coffee, etc., etc., etc., was 111. The index number on January 1st, 1896, for the same things was 62. This difference shows a fall of nearly 50 p. c. in the price of a hundred leading commodities. No wonder the working man in England is so well off, and the poor-rates so low, only 2¼ per cent of the population of England and Wales being in receipt of parish-relief.

AGRICULTURAL CHEMISTRY.

Professor Shutt's lecture; Value of chemistry to the Farmer: Analysis of soils; growth of legumes; fodder-crops; Well-water; Ontario dairymen.

Professor Shutt delivered, in March, the third lecture of the "Somerville Course," at the rooms of the Natural History Society of Montreal. The lecture was most interesting, and the attendance was fair. We give a very condensed report of the chief features of the address.

"The factors of a soil's fertility may be enumerated as: 1. The amount and availability of its plant-food; 2. its mechanical condition; 3. the condition of climate, rainfall, temperature, etc. It is thus apparent that the knowledge offered by the chemical analysis is of great value in inducating the probable productiveness of a soil.

Speaking of "virgin soils", which had been analysed by the government chemists, Prof. Shutt said that in British Columbia, between the Fraser and Pitt rivers, were many thousands of acres equal in richness of composition and mechanical texture to any soils in the world.

Unfortunately, both in Ontario and Quebec, and, to some extent in one or two other provinces of the Dominion, the practice of burning when clearing land in bush, had been most disastrous over large districts, destroying vast accumulations of humus and nitrogen, which could only be replaced by many decades of skilful fostering and care. Many of the farms in the Quebec province were in a condition of practical exhaustion, owing to the constant repetition of grain-crops.

The examination of Canadian cultivated soils pointed to the fact that certain economical methods of improving them might be recommended; such as: 1. a more extensive growth of legumes,—pease, beans, clover, etc., which assimilate the free nitrogen of the air; 2. the application of "wood-ashes" to supplement the farm-yard manure; 3. the judicious application of lime, marl, or gypsum.

As to grasses for fodder, "June-grass" is, in all respects, a most excellent pasture-grass, and should receive more attention than heretofore; "red-top", for low lands, and "orchard-grass," for shady pasture, were most valuable grasses."

Mr Shutt mentions among the grasses "Austrian brown-grass"; is not this a misprint for "brome-grass"?

"Well waters on farms were doubtless a frequent cause of disease both as regards man and beast, on account of the infiltration of contaminating matters. The Ontario dairyman are talking of compelling the patrons to free their well-water from all deleterious ingredients."

The well at the "Fosbrooke-Farm," at Sorel, when we went there, in 1884, was perfectly putrid; the stink of it was almost as strong as the stink of the celebrated Harrogate-water, of which Smollett said, in the middle of the last century, that it was doubtful whether it was more redolent of rotten eggs or of the washing of gun-barrels; V. Humphrey Clinker, a book the great Dr Arnold of Rugby said he had read through fifty times. The evil was caused by sulphuretted hydrogen.

SEED REPORT.—The "seed report" of the correspondents of the "Farmers' Advocate" we have just received, and note the following items:

"American Banner" seems to be the favourite oat. Very little rape grown, except at Peterboro, Elgin, and Waterloo, Ont.

Sherbrooke, Que.,

W. A. HALE

(1) "Oats".—The American Banner is more grown than all the other known varieties, though there is still too little attention paid to the matter of named varieties. So far I find none as good for all-round purposes. "Barley". Two-rowed Chevalier (improved) is principally grown; not for brewing or export, nearly all being ground for pigs' feed, and meal for dairy stock. "Pease." - Golden Vine and Prince Albert are still the favorites, though others are said to yield more; they are sown with oats more than formerly. "Spring Wheat."—White Russian (or Lost Nation), White Fyfe and Red Fyfe are the order of popularity, though the latter yields the most; and, though flour is and probably always will be, cheap, many farmers here prefer flour from their own-grown wheat. "Buckwheat" —The Rough-hulled is almost entirely grown, the Black or Smooth-hulled being peculiar to the Valley of the St. Lawrence; this latter is supposed to foul the land less for after crops. Japanese seems to have gone out of notice. "Beans."—White Marrowfat or Navy is principally grown for field culture. The Burlingame Medium is recommended where a small white bean is desired; they are less liable to rust than the Boston pea bean. "Millet"—Very little grown; not enough to give an opinion. Have only grown the common millet, and believe it as good as any; seldom seen even at exhibitions. "Potatoes".—More Early Rose than any other variety. Beauty of Hebron comes next, but rots badly. Lee's Favorite is looked to as a successor to the Early Rose, which has established a demand for a pink variety. Stray Beauty, being extra early, usually escapes the early August rust and rot, but is little in consequence. Early Rose, from the Lower St. Lawrence is still vigorous, very prolific, and of large size and yield. "Turnips".—(Swedes) Lang's Purple-top leads for stock or market. Champion is rivaling it. Yellow and white turnips but little grown for stock. "Mangels".—Yellow Globe more grown than all the other varieties; suits the soil best, and is much more easily harvested than the Red Mammoth. "Carrots."—(White) Mammoth White Intermediate has superseded the White Belgian, and for many reasons. Danvers gives good results in close culture.

(2) New varieties.—Have tried in potatoes, "Pride of Erin;" large, but worthless.

(3) Corn.—For cob, Early Canada Yellow (Large Yellow Flint). For silo, Thoroughbred White Flint and Evergreen Red Cob lead. Either of these in alternate rows with Compton's Early make a good mixture. Longfellow is preferred to Livingstone. Stowell's Evergreen (sweet) is largely used as green fodder, and makes good silage or dry fodder.

(4) Very little so far is done in providing extra fall feed for dairy stock; green corn fodder is principally used. The injurous custom (1) of pasturing aftermath is still frequently followed.

(1) Where timothy is the grass the custom is injurious.—ED.

(5) Feeding rape.—Except for thoroughbred sheep and for exhibition purposes rape scarcely pays with lambs at $2 each.

(6) Clovers. Mammoth (Long Vermont) when mixed with timothy; June when mixed with orchard grass, both ripen in proper time. (2) Alsike is much used in all mixtures, as well as alone, as it does not injure the sale of hay, as red clovers do. June clover alone, or alsike alone, I prefer to Mammoth alone the latter "kneeing" down badly, and is more difficult to cure. (3) Timothy in grasses still leads. Orchard grass does not seem to grow in favor. June grass is indigenous, and takes the lead in old meadows, but the fancy mixtures are more profitable to the seedmen than to the farmers.

(7) Permanent pastures, which largely prevail, in many cases are necessary, and help to give the good reputation that Eastern Townships cheese and butter have earned. (4) June grass and white clover are the prevaling forage plants."

If our old friend, Mr. Wm. Hale, would try rape earnestly, and judge of its usefulness by the yield of the succeeding crops, we feel sure he would change his mind about it.—Ed.

BRITISH CROPS OF 1891-95.

(Bushels per imp. acre.)

Wheat.

	'91	'95	Average. 1885-1891
England	30.7	26.2	29.3
Wales	25.1	21.6	23.3
Scotland	37.1	32.8	35.3

Barley.

England	34.6	31.6	33.1
Wales	30.0	26.8	28.0
Scotland	35.5	34.9	35.3

Oats.

England	44.6	38.4	40.6
Wales	35.9	31.6	32.6
Scotland	37.3	35.5	35.6

Potatoes.

	tons.	tons.	
England	5.8	6.7	5.9
Wales	5.5	6.7	5.6
Scotland	4.8	6.3	5.6

Reduced to bushels of 60 lbs. each the average yield for 10 years of Britsh acre of potatoes will stand thus:

England ..... 220 Bushels
Wales ..... 210 "
Scotland ..... 210 "

Two things in these returns puzzle us: the yield of potatoes and oats in Scotland. Allowing for the invariably heavier weight of the Scotch oat over the English—probably, in the proportion of 41 to 38—we should certainly have expected Scotland to have beaten England into fits in this grain.

As to potatoes, we should not have been surprised if the yield of that esculent had been 50 or 60 bushels an acre

(2, No injury inflicted in pasturing orchard-grass and clover

(3) Try cutting it before it "knees-down." ED.

(4) See letter from Wm. Macfarlane; p. 143, Jan. 1881 No. of the Journal.—ED.

over the yield in England, instead of being exactly the same as in Wales, where cultivation, on the whole, is very backward.

In Scotland, in 1855, only 1,104,009 bushels of wheat was grown, on about 34,000 acres, in 1894, 45,000 acres produced 1,665,000 bushels.

England's wheat crop in 1891 was 56,088,000 bushels; in 1895, only 35,120,000.

FEATHER-EATING FOWLS.—This is due to a minute parasitic mite at the roots of the feathers, and not, as absurdly supposed by many people, to a vicious habit. The mites can be easily found among the white powdery matter at the base of the quill, the fowls pluck out the feathers to destroy the irritation caused by the mites.

CURE.—One part creosote to 30 of vaseline, rubbed into the affected area.

U. S. CROP OF POTATOES, in 1894, averaged 62.3 bushels—1.65 tons of 2240 lbs.; in 1895, 100.6 bushels—2.56 tons. We constantly hear of the very small quantity of potato-sets planted to the acre in the States, 6 and 8 bushels being commonly mentioned. The ordinary seeding in England is 22 to 24 bushels, or, in weight 12 cwt.—1344 lbs. One or the other quantity must be wrong.

Again, supposing potatoes are planted at 2 feet x 1 foot, it will take, in round numbers, 20,000 sets to plant an acre; so, if each set turns out only a pound of ripe tubers, the yield should be ten tons to the acre!

HARVEST IN MANITOBA IN 1895.—According to the final official reports of the results of the harvest in Manitoba, the actual outturn of grain from the machine shows a general increase in the yield per acre of wheat over the large estimates given in the August report. The following tables give a summary of the yields of the principal crops of the Province:—

Crops.	Acreage.		Production.	
	1895	1894	1895	1894
	Acres.	Acres.	Bushels.	Bushels.
Wheat	1,140,276	1,010,186	31,775,038	17,172,883
Oats	482,658	413,686	22,555,733	11,907,854
Barley	153,839	119,528	5,645,036	2,981,716
Potatoes	16,716	13,300	4,042,562	2,035,336

The wheat crop, which exceeds that of the previous year by over 80 per cent., is said to have enabled farmers to sell sufficient grain to pay off pressing liabilities, while still holding the greater part of the crop. The oat crop is stated to have been fully matured and very heavy. In past years, it is observed, farmers have invariably sold short of wheat and even of coarse grains, not having enough on hand during the following summer to feed hogs and poultry properly. The surplus of wheat and coarse grains this year will materially change conditions in the coming season, when the proceeds of the grain fields will be marketed as food products in the form of cattle, hogs, poultry, and dairy produce. Owing to the protracted harvest, caused by the heavy work entailed, the amount of land prepared for next year's wheat crop is much below the average.

PIG FEEDING.

PIG FEEDING.—The "Deutsche Landwirtschaftliche Presse" has published an account of various experiments in feeding swine carried out at the Dairy Institute of Proskau during the summer of 1894. Four pairs of pigs, of about seven weeks old, were selected. The objects of the experiments were to determine whether feeding with whole grain barly was deleterious, when given in large quantities; to compare the feeding properties of barley and maize, both given in conjunction with skim-milk; and to determine more exactly the nourishing value of whey. During the earlier portion of these trials (April 21—June 24) the first pair were given whole barley, the second crushed barley, the third crushed maize, and the fourth crushed maize with whey. Numbers 1, 2, and 3 were also given equal quantities of potatoes; and the weight of whey given to the fourth pair was about three times the weight of potatoes given to the third pair, equal amounts of maize being given. The same quantity of skim-milk was throughout given to all four pairs.

Until the 24th June (nine weeks) the process ran perfectly smoothly with all the pigs. After this date, several variations in the quantity and kind of food given were at different times introduced, the weights of the animals being throughout carefully noted. By about the beginning of August, it had been established that the crushed barley had produced better results than whole grain; also that up to this point the crushed barley had proved superior to the crushed maize.

The experiments were interfered with so far as concerned the pigs receiving the maize, by these refusing their food at the same time as they were attacked with "bone-stiffness (Knochensteifheit). This may very possibly have been due to the feeding of such young pigs with too much maize. The effect of increasing the daily rations of whole grain barley on the first pair was also deleterious, for they also refused their food simultaneously with the advent of a severe attack of "bone-stiffness. The period during which the animals were in ill-health has been rejected in instituting comparisons of the different feeding stuffs.

The general result of the experiments led to the conclusion that giving barley in whole rough grains is harmful, not only dietetically, but also from the point of view of complete assimilation of the fool, and that it is not advisable, with young pigs, up to about four months old, to give them a concentrated feed of maize, but that later, if it is merely a question of aiming solely at the more rapid fattening of the animals at the same outlay, the maize should have the preference over the barley. The quality of the meat has not been taken into consideration. The comparison of the whey with the potatoes led to no result, as one of the fourth pair suddenly refused its food, and thus invalidated the experiment.

REPORT OF THE OFFICIAL ANALYST.

MILK.

Professor Macfarlane, has kindly sent us a copy of his report on the milk-supply of the principal towns of the Dominion, from which we gather the following facts:

Out of 260 samples collected, 187 were genuine, 11 were watered, 7 were partly skimmed, 20 were under average in total solids, 19 were under average in cream.

A general improvement has taken place in quality, particularly in Halifax, N. S., Quebec, London, and Saint-Thomas, while Montreal and Toronto remain stationary; and Ottawa has retrogaded.

How comes it that Sorel, the soil of which is poor enough in all conscience, should yield about the richest of all the samples? It cannot be from the breed of the cows, for except some slight cross of the Guernsey from our bull "Refus," by "Presto" of "Prôel," out of "Rougette" of "St. Andrews," the stock at Sorel is a mongrel lot. However, the official analysis stands thus:

			Sorel, P. Q.						
Nov.	5	15843	Pierre Salvealla, St-Anns.. ..	85.69	5.09	9.22	14.31	1.0337	Genuine.
				85.52	5.16	9.32	14.48	1.0340	do
do	5	15844	Nap. Salvealla, St-Anns.....	87.34	4.97	8.69	12..66	1.0344	do
				87.16	3.90	8.94	12.84	1.0343	do
do	5	15845	N. Cartier, Queen St.....	86.50	4.55	8.95	13.50	1.0349	do
				88.44	4.43	9.13	13.56	1.0353	do
do	5	15846	P. Guèvremont St-Anns.....	86.54	4.35	9.11	13.46	1.0347	do
				86.39	4.25	9.36	13.61	1.0353	do
do	5	15847	S. Guèvremont	86.76	4.66	8.58	13.24	1.0327	do
				86.82	4.50	8.68	13.18	1.0333	do
do	5	15848	N. Pelletier, St-Pierre.....	86.97	4.42	8.61	13.03	1.0330	do
				86.81	4.30	8.89	13.19	1.0338	do

And a very creditable showing it is. Toronto, on the other hand, out of 16 samples, has only half returned as genuine; Montreal, 16 out of 22.

BUTTER, CHEESE, &c., IN LONDON:—The price of dairy produce in the London market, according to the "grocer," the organ of the trade, stood thus in January, 1896; we only quote the highest prices:

Butter.....per 112 lbs	c.	d.
Cork, 1st.....121	0	
French baskets.....122	0	
Danish, &c 116	6	
Fresh roles (foreign) per doz. lbs...15	6	

CHEESE

	s.	d.
Cheddar.....68	0	
Cheshire.....81	6	
Glos'ter.....56	6	
Wiltshire.....60	5	

Ha! The Cheshire pastures are not easily beaten even now.

PRESERVATION OF FRESH BUTTER.—The "Bulletin des Halles", a Paris organ of the market of that city, has an article, in a recent number, on a novel way of preserving butter, which we condensed for the benefit of our readers.

After expatiating on the difficulty of preserving fresh-butter from rancidity, the paper continues as follows:

In England 4 p. c. of finely pulverised salt is generally used, but in some places a mixture, consisting of

2 parts of salt
1 part of saltpetre
1 part of sugar

is preferred. This gives to the butter a less sharp taste than salt alone.

Again, it has been essayed to create in the vessel containing the butter an artificial atmosphere, perfectly free from oxygen, and for this purpose the air is replaced by carbonic acid.

Such, for instance, is the case with butter encosed in soldered tin-boxes, with 3 grammes of tartaric acid and 1 gramme of bi carbonate of soda to the pound. The box being soldered down, the carbonic acid is produced slowly, finds no means of escape, and impregnates the butter uniformely. As for the use of salicylic, boric acid, and other antiseptics, their use should entirely be forbidden; for they are decidedly unwholesome, and, if their use is persisted in, the consumer must inevitably suffer. Besides, they impart a flavour of their own to the butter, which has spoiled a great deal of the best product of Normandy.

Something, then, had to be discovered; something easy to use, and that would give no special taste to the butter, or, which is better, capable of taking away any bad taste already existing in it. This was the problem from the hygienic point of view. Viewed practically, it was necessary to avoid the use of great, heavy jars or cans; and the covers too must not need soldering, lest the expense of the vessel should eat up the profits. Mr. Villar, the inventor of the new process, proposes to employ a recently discovered material called "crysolcine" colourless and soluble, in small quantities, in water. The butter is worked in the usual machine, and, during the operation, some of the solution (1 to 200 of water) is added by degrees. The lumps are then simply packed in large but light cans, which are filled with the same solution. This done, each can is closed by a cover fastened by a press-screw, and an "amianthus" joint insures its hermetical tightness.

When the butter is to be handed over to the customer, it is taken out of the can and worked over with water. The crysolcine is thus disengaged from the butter and leaves no trace of its flavour or odour. The butter thus treated can be kept for months without injury. The cost of the agent employed is a mere trifle.

We hear that the Dairy-school at St. Hyacinthe will probably institute experiments to test the value of this invention

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SPAYING HEIFERS.—This operation was common enough in England sixty-years ago, but since so much attention has been devoted to breeding good stock, it has been in great measure given up. The operation consists of cutting into the flank of the cow and destroying the ovaries by the introduction of the hand. The meat of a spayed heifer was always esteemed of very superior quality, and, of course, the fattening of such was very rapid. It is a great pity the sow-pigs not wanted for breeding are not spayed: they

would pay well for the operation, as the constant recurrence of the amatory period keeps the open sows back a good deal.

A GOOD OLD AGE.—May we be for given if we transfer the following family matter to the columns of this periodical ?

"Hearty congratulations, from cricketers and Gloucestrians generally, go forth to Mr Herbert Jenner Fust, who completed his 90th birthday on February 23rd, he having been born in 1806. Mr. Jenner Fust played for Eton v. Harrow in 1822, and for Cambridge in the first University match in 1827 a. Lord's. What a revolution he has seen in the king of summer games !"

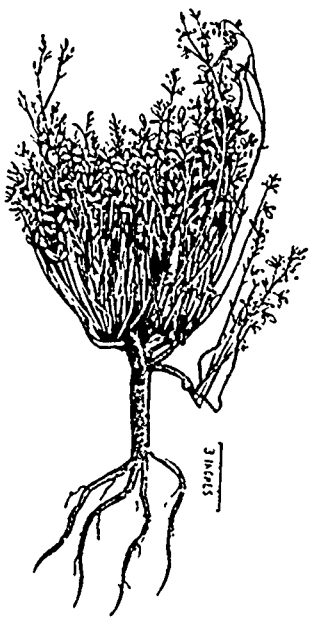
The subject of the above notice, from the "Gloucester Chronicle," still goes out shooting two or three times a week during the season. In 1880, at the age of 74, he played in a match, Hill vs. Rockhampton, and made eleven runs, keeping wicket and bowling throughout the match with the result of ten wickets to his share, besides "running-out" two more. Two of his brothers, of whom the Ex-Bishop of Dunedin is one, were also in the University eleven at Cambridge.

LUCERNE.—As every sensible farmer is on the look-out nowadays for fodder-plants to supplement his pastures in the hot months, we hope those who are fortunate enough to possess land with a dry subsoil will give lucerne a fair trial this spring. People will run away with the idea that "alfalfa," as the Spaniards call it, is peculiar in its habits and costly to grow This is a mistake. Treat it just as you would clover. Sow as early as possible, 18 lbs. of clean, "sound" seed, with any spring-grain; barley for choice; cover it a little deeper perhaps than other clovers, roll it down with a moderate roller, and leave it to the mercies of the season. Do not run stock, especially sheep or horses, on it in the fall, and, before winter, give it a fair dressing of rough manure. Broadcast work is far better for this plant than sowing in rows.. Hoeing lucerne, when it has been tried has, in our experience, always been followed by the piece being ploughed up. After the second year, it should be harrowed in early October till the land looks like a fallow: you cannot hurt it, as by that time, the roots will have got down. at the very least. two feet in to the subsoil. Of course, the rich light loams are the best soil for lucerne, as the are for most crops, but the main point is a dry subsoil. The roots are persistent foragers, and have often been traced down 12 to 13 feet below the surface; some say, from 50 to 60 feet, but that is a rather rash statement, though nothing is impossible. Lucerne cannot be over-manured. It should be cut early, and often, as its only fault is that, when the stem becomes sticky, cattle do not care for it: just like Hungarian grass. Mind the seed is "fresh," or make an allowance of an extra pound or two to the acre.

DESCRIPTION.—Lucerne is an upright, branching, smooth perennial, one foot to three feet high. Its leaves are three-parted, each piece being broadest above the middle, rounded in outline and slightly toothed towards the apex. The purple flowers are in long, loose clusters which are scattered all over the plant. The ripe pods (a, b) are twistel through two or three complete curves. The seeds (c) are kidney-shapel, yellowish brown, and

LUCERNE—*a b*, SEED POD; *c*, SEED.

average about one twelfth of an inch long by half as thick. It is a deep eeder, sending its taproots 10 or 12 eet down in loose and permeable soil,



LUCERNE - THREE YEARS OLD

and has been recorded to have gone down to the depth of 50 and 66 feet. When the stems are cut or grazed off, the stalk dies down to the very base, and new buds spring up on the upper part or crown of the root and grow.

THE WEATHER.—Well! Four fee of snow fell, at Montreal in March ! and it is snowing now. April 2nd.

MUTTON.—Why should there be such a tremendons difference in the price of sheep in the London market ? At the great Chrismas market, while Downs weighing 64 lbs sold for six shillings ($1.44) a stone of 8 lbs, the offal of Canadian sheep of the same weight only fetched 96 cents a stone !It clearly is not owing to the size, so it must be the quality of the meat As with our cheese, so with our mutton; we made the former good by dint of hammering at the makers, and f we hammer hard enough at the sheep men, they will have to see that old rams and ewes will not pay for exportation, either alive or dead. The model sheep for the best London (West-end) trade is, as we have said a dozen times, a shearling wether, weighing from 64 lbs to at most 72 lbs., ripe but not over fat, and of either Southdown, Hampshire-down, or Shropshire breed; Oxfordshires are perhaps a shade too heavy, but still they fetch a good price and are well-liked; but the darker faces are always preferred. Here is a common passage in the Salesmens' reports: "Best quality wethers made 2d per 8 lbs. more money, but heavy breeds were a turn in favour of the buyer."

WASHING SHEEP—As the season for washing sheep will be approaching when this number of the journal reaches the subscribers, it will be well to prepare for that important operation in time, that is, not to be taken unawares by any sudden change of weather. For of course you will wash your sheep before shearing them, and it is a convenience to have the barn cleared out and ready to receive them in case it rains on the day appointed for that operation. If it were possible to wash the fleece to advantage after shearing, the advocates of that plan might be justified in their practice, but it has been found that any system of washing or cleaning wool when shorn, results in a serious loss of weight and quality. Mr. Willett, the well known proprietor of the well known woollen mills at Chambly, told us, in 1862, that he had never seen wool come into his place in such condition as the 45 fleeces we had just arranged for M. Amable Demers of Chambly Bassin. The ewes with their lambs were driven, on the 1st June, to a brook and confined within hurdles: a large tub was placed on the margin of the stream into which the sheep were plunged, and it only took 2 or 3 minutes to wash each of them. After about a week, or so, the yolk or excretion of the glands had risen into the fleece; the ewes were then shorn, with the results above noted as to the condition of the wool.

PRICE OF WOOL IN ENGLAND—What a change! "Lustre" wool, as it s called, is now worth 16d to 16½d a pound for Lincoln fleeces, while Southdown teg-wool, I. e., the first clip, only fetches 10½d !

The following is by Prof. Wrightson, of the College, Downton, Salisbury, England.

VALUE OF THE ROOT CROP

The estimation in which the root crop s held has suffered from the foolish dea that it is nine-tenths water. It loes not apparently enter into the minds of these people that the turnip s only like other luscious vegetation n this respect. It is not water, but uice of highly nutritive property. The turnip is able to fatten sheep rapidly, nd is, in fact, a cheap and wholesome food. It requires a certain amount of dry food, but turnips and hay are sufficient to fatten well-bred sheep, as I know by long experience. I am obliged for the testimony of Mr. W. T. Lawrence (p. 476) on this point—that turnips are worth 5d. per sheep per week to let, besides the profit to the feeder. Now, as a fair crop of turnips will maintain 250 sheep a week, it is worth on this figure £5 4s. 2d. per acre without the profits of the feeder. Of the value of turnips as food for stock we have abundant evidence of the highest authority, which could be quoted if space allowed. The great point in favour of them is their entire digestibility, so that if they contain only a small proportion of dry matter it is all of value. As to the water, it is doubtful if it is just to consider it in that light. Beer is fattening and contains more water than turnips. Water is considered to be fattening by many, and certainly drinking conduces to fatness, and no wonder, as the animal body is largely composed of water. It is the beautiful combination of water with the cellular mass of the turnip which Nature has contrived which is the secret of the value of turnips. If the turnip were artificially reduced to dryness it would lose much of its value. We little understand the alchemy of Nature, and it is folly to state that a turnip is a poor food because it contains 90 per cent. of water. As well might milk or soups be stigmatised as poor foods, or eggs or beefsteaks, all of which contain a preponderating weight of "water". The amount of water, according to analysis, in wine or in any other juice is not held up as proving that they are not possessed of certain properties. "If water in a turnip or peach is to be classed with water from the pump, we lose sight of the cunning incorporation of water in all our most esteemed foods." Even the human brain is largely composed of water. Without doubt it is a cardinal rror to consider that the water which forms an integral part of the mass, as though it could be dispensed with and made good through the use of the bucket. In support of this let us think of the "fattening properties of young grass," and contrast them with hay, and such reflection may convince them who stigmatise a ton of turnips as little better than a ton of pump water.

JOHN WRIGHTSON.

CHEAP WAY OF FATTENING HOGS.

Clover-pasture—By this system the land is enriched, and the following crops are plentiful—What mineral manures to use.

While on their tour of inspection, the farm of Mr. Talbot, of Bellechasse, was visited by the Judges of the Competition of Agricultural Merit. This farmer fattens his hogs very cheaply; in summer, he gives them whey and a run in a clover-field. The seeding of this consisted of 1 lbs. of white, 1 lb. of alsike, and 10 lbs. of red clover. By the fall, his hogs are half-fat, and only need a little grain to finish them, and the following year, a capital crop of corn follows the clover. For clover has the power of assimilating the free nitrogen of the air, which is found again in the roots, etc., of the plant that remain in the land, as well as in the droppings of the hogs, to which may be added part of the nitrogen from the consumption of the whey. In order to perfect the manure, phosphoric acid and potash must be added, which can be done by supplying to each arpent 300 lbs. of mineral superphosphate, costing about $4.00, and 15 bushels of non-lixiviated wood ashes, worth about $1.50.

This pasturing of clover will allow of the fattening of a vast number of hogs, but the finishing off must be done with pease or barley, rather than with corn. A shelter of some sort against the hot sun of our summer will be necessary.—(From the French.)

Farm-Buildings.

PLANS FOR PIGGERIES.

By Prof. Robertson, Dominion Dairy-Commissioner, Ottawa.

Fig. 1 is the ground-floor plan of the piggery. The details of the walls, the floors, and the drains are shown in fig. 111.

The upper part of the floor is to be made of inch-boards of good hemlock; this is, here, more durable than pine. A wood-floor is more wholesome for pigs than a floor of stone or cement. The fall of three inches from the back of each sty to the drain that runs along the passage and the trough, is meant to preserve a place perfectly dry for the pigs to sleep in.

If a larger piggery is wanted, it will suffice to lengthen the one in the plan in the direction of the passage. In that case, a fall of 1 in 10 must be given lengthways of the piggery, in the direction in which the gutters empty.

Fig. 11 is the plan of the ground-floor of a piggery built in the basement or in any other part of a barn.

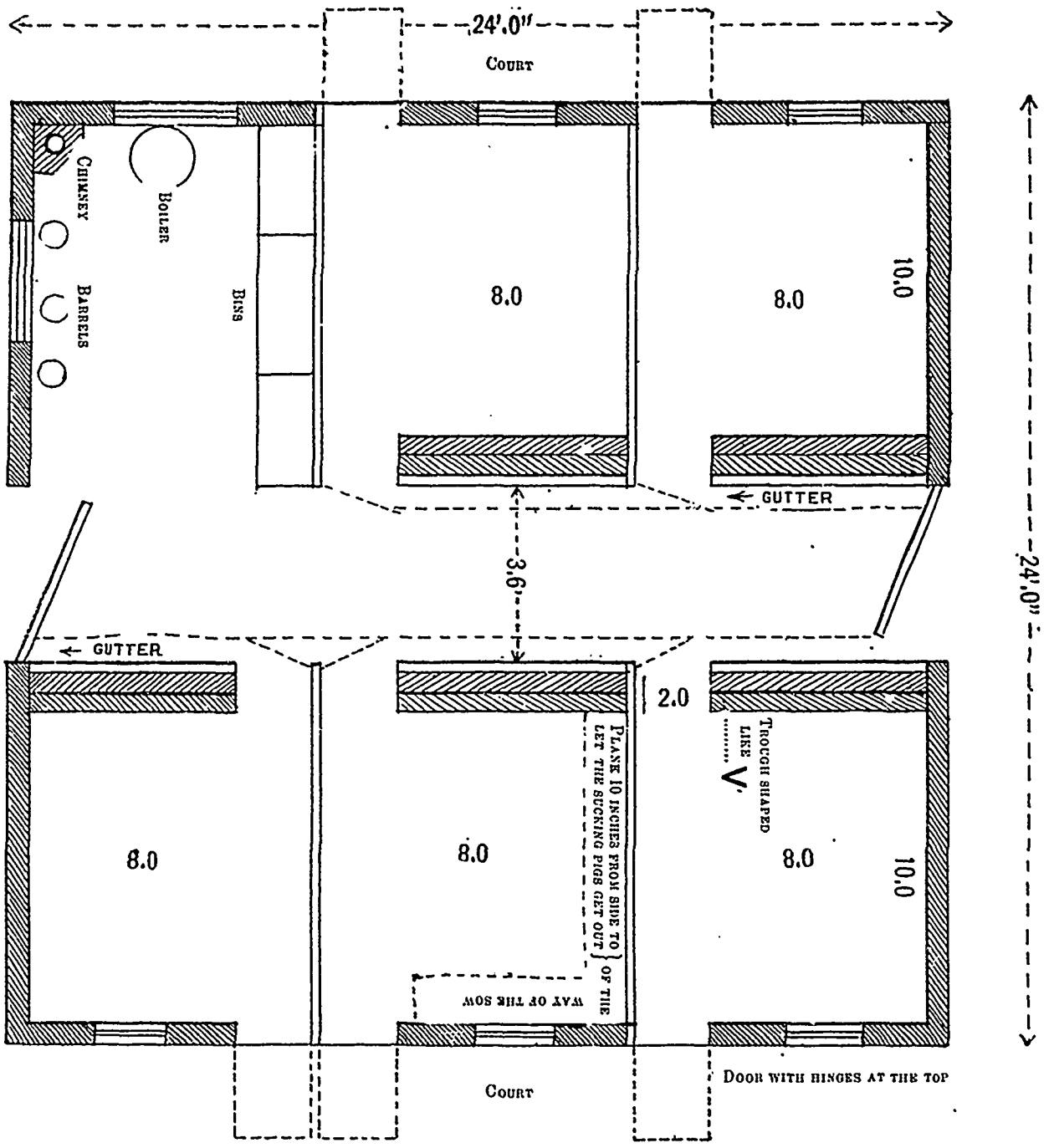
The outside walls A, with doors and windows, show the walls of the barn or other building inside which the piggery is built. On three of the sides, runs a passage 3 feet wide. As in the first case, the floor must have a slope of 3 inches from the back to the front of each sty.

Fig. III shows the section of one or the sides of the piggery.

The details of the construction of the drains or gutters are seen in fig. IV. There should be *an opening in the* ceiling of each sty—in the bark part—for the introduction of litter. They should be furnished with good trap-doors to keep the cold out.

Fig. IV shows the details of the troughs, of the door which is hung above, of the step (marche-pied) that can be raised, of the gutter, and of the passage. The door is to be keep in its place by a long transverse bar of wood, or by a bolt.—(From the French.)

Fig. 1 A PIGGERY—STANDING ALONE



PLAN OF PIGGERY

THE FLOOR TO SLOPE 3 INCHES TOWARDS THE GUTTERS IN THE PASSAGE THAT RUNS ALONG THE FEET OF SOWS

AN EASILY BUILT WINDMILL.

Windmills are often very useful on farms for the purpose of working pumps, chaff-cutters, &c.

We give a sketch of a mill very common on the banks of the St. Lawrence and in the East of the province: it is almost exclusively used for threshing. The scale is one of eight feet to the inch.

It is placed along one of the greater sides of the barn. It is composed of two strong wooden uprights, which in the sketch are one behind another, "a," "a", deeply sunk in the ground, and strongly supported on all sides by *braces (buttresses ?) like "b,b,b,b." To* keep them at a determinate distance from the shed, horizontal pieces of wood, "c,c,c,c," are used, which act as buttresses. The two uprights "a. a," support a wooden shaft on which are fixed the six arms "d, d," intended to support the sails. Each of these arms is furnished with two transverse bars on whic the sails are fastened (boulonnnées), as shown in the cut. The sails are set at an angle of 45o to the direction of the wind.

Motion is given to the threshing machine in the barn by a wooden pulley on the shaft and an iron chain "e,e,e,e."

A brake or drag, like that of a carriage, acts on another pulley placed alongside of the former one, and of the same diameter. It is put in motion by means of a long wooden rod, the end of which is in the barn close to the man who works the machine; he can regulate the pace of the machine, or stop it altogether, by raising or lowering the end of the rod.

The great trouble with this mill is that it will only work with the wind from one point, so it must be always set perpendicularly to the prevailing wind of the district. When it is idle, the sails are to be taken indoors, for *if left in position, a sudden blast of* wind might carry them away or break the arms.—(From the French.)

FOOD FOR MILCH-COWS.

Mr. Wilson of the Experiment-farm at Ottawa, recommends the following system of feeding milch-cows, the result of his experiments:

When milch-cows have attained their development, and are in full milk, their food should contain plenty of nitrogenous matter and water. Roots and silage, with an abundant supply of highly concentrated food, such as linseed-meal, cotton-cake, etc., as complements of lots of the best hay. *Fed in this way*, cows will give a full yield of milk, without increasing or

diminishing in weight. When cows are to be fattened for the butcher while giving milk, the proportion of meal should be increased, and ground corn or other grain should be added to the rations, the rest remaining as before, except that, perhaps, the quantity of silage or roots may be lessened. (1).

In summer, the hay and silage may be replaced by pasture or green-fodder crops, the rest of the ration being constant.

For cows with a tendency to fatten, the proportion of farinaceous food should be diminished, and the non fat-formers be increased.

FARM-WORK FOR MAY.

Preparation of cattle for grass—Care of calves—The flock—Ploughing, &c.—Manure-management—The root-crop.

If you are wise, it will long ago have occurred to you that the digestive organs of "cattle" are not unlikely to be astonished if, all of a sudden, the dyr food on which they have solely fed during the last few months is changed into the succulent grasses of the pastures.. Herein lies one of the great benefits of the silo; it has converted the absolutely unnatural food—hay and straw—of the cow into the almost natural admixture of green-fodder and grain, with a very little hay and straw There are still some people who "do not believe in silage," but they are few in number, and ary rapidly becoming fewer.

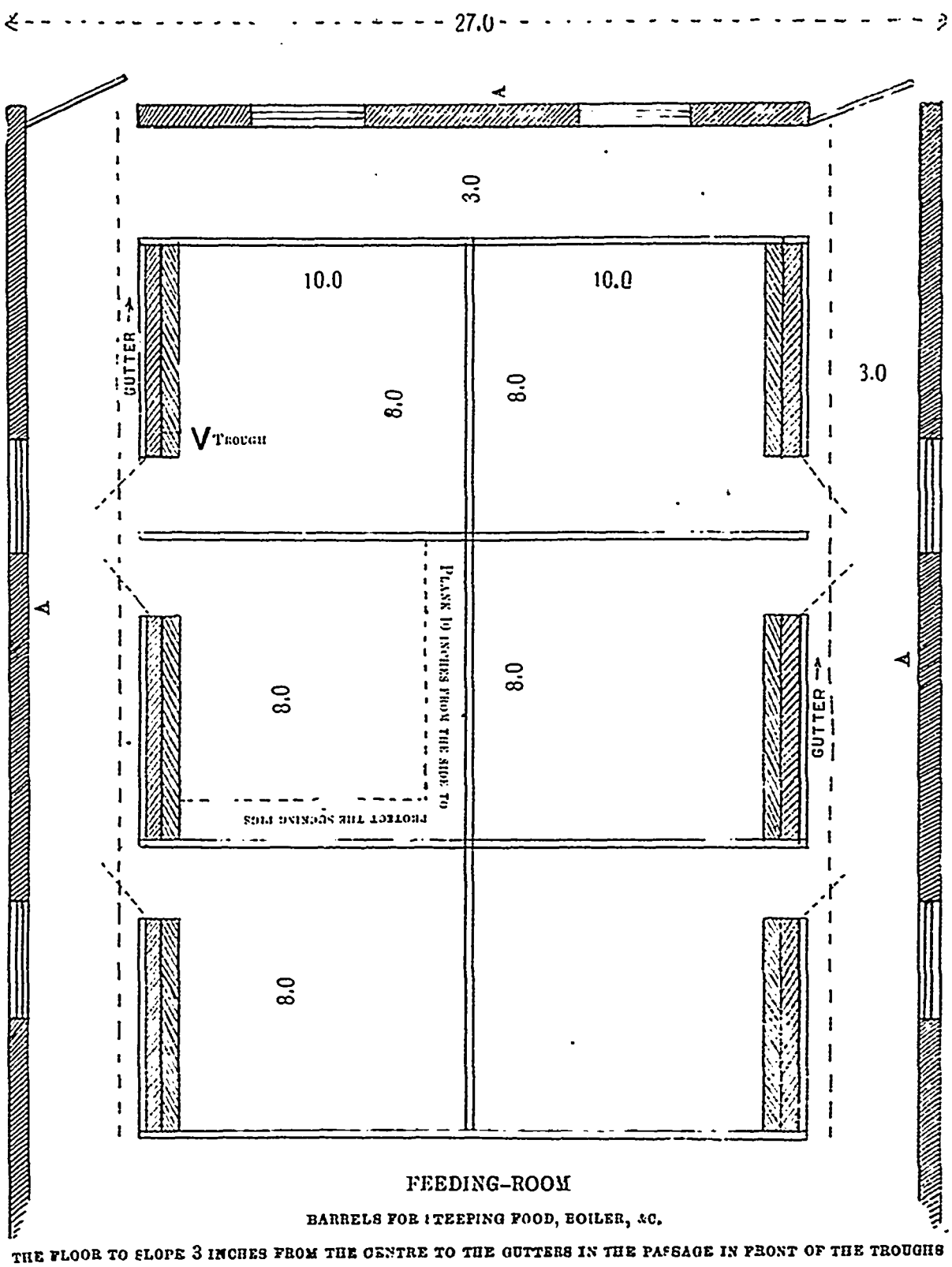
Where no silage is to be found, there more care must be taken in preparing cattle for the pasture. They should only be allowed a few hours run at first; say, from 10 A.M. to 2 P.M.; and not even that, if the weather is wet and blustery; and the full feeding in the house should not be diminished; at least, the animals should have as much of it has they care to take. Needless to say that cows should be kept in at night until really genial weather has set in.

CALVES, too, demand great attention, particularly in the regularity of the hours of feeding. One most important point, too frequently neglected, is the giving a dry bed to all young animals, but especially to those still receiving milk whether from the teat, like pigs, or from the pail, like calves. The smell of a dirty calf-pen is one of the most disgusting smells to be met with anywhere, far worse than the smell of any mixen, which to our mind is far from unpleasant; from association's sake, perhaps. Do not stop the milk at once, when weaning calves, but by degrees, and take care that the water they have to drink is pure and wholesome. If you like to give them a little extra-food when at grass, the best is a mixture of pease-meal and crushed flax-seed; not corn on any account. We see, by our exchanges, that the dairymen of the United-States are dreadfully afraid of letting their heifer-calves get fat! To our mind, and we have kept a good many cows in our time, this is an absurdity, for if a heifer has got it in her to be a good cow, no treatment, except starvation, will prevent her from discharging the duties of her station. Our great English breed of Dairy-shorthorns are copiously fed in their youth, and yet give their 25 and 30 quarts of milk a day. No; do your young things well, and they will repay you for your care later in life.

SHEEP are too often allowed to run loose over the pastures and meadows near the buildings, thereby spoiling the early grass, for, if the first shoot s nipped off the tender plant, the summer's product will be diminished by one-third. This is the result of numerous experiments conducted by Professor Daubeny, of Oxford, England.

"Lambs," for early slaughter, should have a few pease every day, and if half a pint of oats per head is added it will be all the better. Lamb is always soft enough here—killed too young generally—; the pease will make the flesh firmer and weigh heavier.

Fig. 2 PIGGERY BUILT INSIDE A BARN



THE FLOOR TO SLOPE 3 INCHES FROM THE CENTRE TO THE GUTTERS IN THE PASSAGE IN FRONT OF THE TROUGHS

(1) No pease? Ed.

THE FALL-PLOUGHED STUBBLES will now be ready for their spring-treatment. If you cross-plough on heavy land, beware of going more than at most an inch below the fall furrow: no use bringing up raw soil this time of year. Some slight additional depth must be taken, we suppose, to steady the plough, but the less the better.

The "land after hoed-crops," and the leys, if ploughed in the fall, should never be turned under again. The grubber and harrows are all that need be used, whether broadcast or drill is the implement used for seeding. Pease, put in deep, oats and wheat too, but barley will bear shallower work. If you have no seeder, sow on a well-harrowed surface, let the seed into the ground with the grubber, harrow again, and then, when the grain is up, roll. If no grubber, the sowing must of course be on the undisturbed furrow, and then some of the seed will be buried an inch deep, some two inches, and some not buried at all. The consequence of this will be that the grain produced will be of three qualities, which, in the case of barley will be ruin to it as a sample of malting stuff.

MANURE-HEAPS, intended for roots, should be looked to and turned about ten days before they are wanted, the outsides thrown into the middle and all lumps broken up. It is much easier to spread well made dung in the drills, during the busy season of sowing roots, than dung that has to be divided and broken up then.

The sooner the "mangel"-seed is in the ground now the better. "Swedes," too, may be sown to advantage about the 20th or 25th this month. If any one were to see the monstrous swedes grown among the carrots at Sorel every year—mixed on purpose with the carrot-seed to show the rows for the horse-hoe,—swede-sowing would be down earlier than it is. The quality is not quite so good for the table as if later sown, but the roots are so enormous that the weight more than makes up for the slightly inferior quality.

The following, from the "Country-Gentleman," is not bad. The argument as to the respective value of hen and horse manure tallies almost exactly with our statement of last month. But there is one point to be observed: the solids and liquids of the horse-excretions must both be preserved, as, in the case of the hen they are indivisible.

EDS. COUNTRY GENTLEMAN.—A short time since I noticed in a copy of the 22d Annual Report of the New-Jersey Board of Agriculture a paper by C. E. Chapman of Peruville, N. Y., giving an account of the henneries of C. H. Wyckoff, Groton, N. Y., to which I wish to call your attention. It opens as follows:

Hens, average number....	600
Eggs each, average.....	168
Price per dozen, average...	12½c.
Eggs, net.....	$1800
Stock sold.....	70
Manure at 20c. per bu.....	270
	$2140
Cost of food.....	$960
Labor, 12 months, at $30. .	360
Interest, 5 per c. on $1600..	50
Net profit.....	1070
	$2140

This statement when analyzed gives 5400 doz. eggs at 21½c. equal to $1800, which is the "whole produce" of the 600 hens; in addition to this he says, "Stock sold, $70." Where did this "stock" come from? It certainly could not proceed from the hens, as "all the eggs were sold."

Next, he has made no allowance whatever for small, cracked and defective unsalable eggs. My loss from this source has for the last 20 years averaged 3 per cent.

Then also, he has made no provision for the annual loss of hens by death, accident, etc. My hen's lives average 4 years, so that I have to raise 25 per cent. annually just to supply the loss. After a hen is two years old she decreases rapidly in her laying; that also has to be taken into account.

The most remarkable statement of all is: "Manure, 20c. per bu., $270." This necessitates 1350 bushels. In my experience I have found that an average of slightly less than 16 pounds per day is all that 100 hens can eat, which is about 4 per cent. of their weight, and just double what my hens eat; this would give 96 lb. daily, or 626 bushels of 56 lb. each. Where does he get his 1350 bushels from? He certainly does not feed it. My hens' houses are cleaned weekly and the manure saved carefully; and each house of 50 hens produces "one peck" of manure, mixed with road dust and plaster, making 12½ bushels equal to 150 bushels for 600 hens. My hens' feed is four-fifths wheat, other varieties of grain, etc.

Now as to the value of this manure. I keep four horses of 1200 lb. each, and feed each 16 lb. of grain and from 12 to 15 lb. of hay—just as much as they can eat, and they are always fat. This hay fed is equal to 8 lb. of grain, making an equivalent of 24 lb. of grain to each horse; making 96 lb. for the four—just the same amount as fed to the 600 hens. The grain fed to my horses is richer as manure than that fed to the hens, consequently what manure I have from the horses is fully equal to, if not more valuable than, that fromb the hens. I can get all the manure I can cart from the towns near me for $1 per horse per year; during the war I paid as high as $4 per head. Where does the $270 in manure come from?"

TRIFOLIUM INCARNATUM.

CRIMSON-CLOVER.—Is a very peculiar clover in its habit of growth. We have grown plenty of it in England, and the more preparation the land receives, the worse the crop. The only treatment it receives with the South of England farmers, is a thorough harrowing of the wheat-stubble, as soon after harvest as possible, and a good heavy rolling after the seed is sown. But there is not much use in describing, its cultivation here, as, even in England it is futile to attempt growing it North of Yorkshire, and it is hardly necessary to say that the climate of Canada is far severer than the climate of that county. Lucerne, on well drained loam, would be a far more certain crop here than the crimson-clover, and last much longer, the c. c. being an annual, and only giving one cut, which is not of much value, its earliness: and even in that quality Lucerne beats it: being almost its only useful point.

Fig. 3

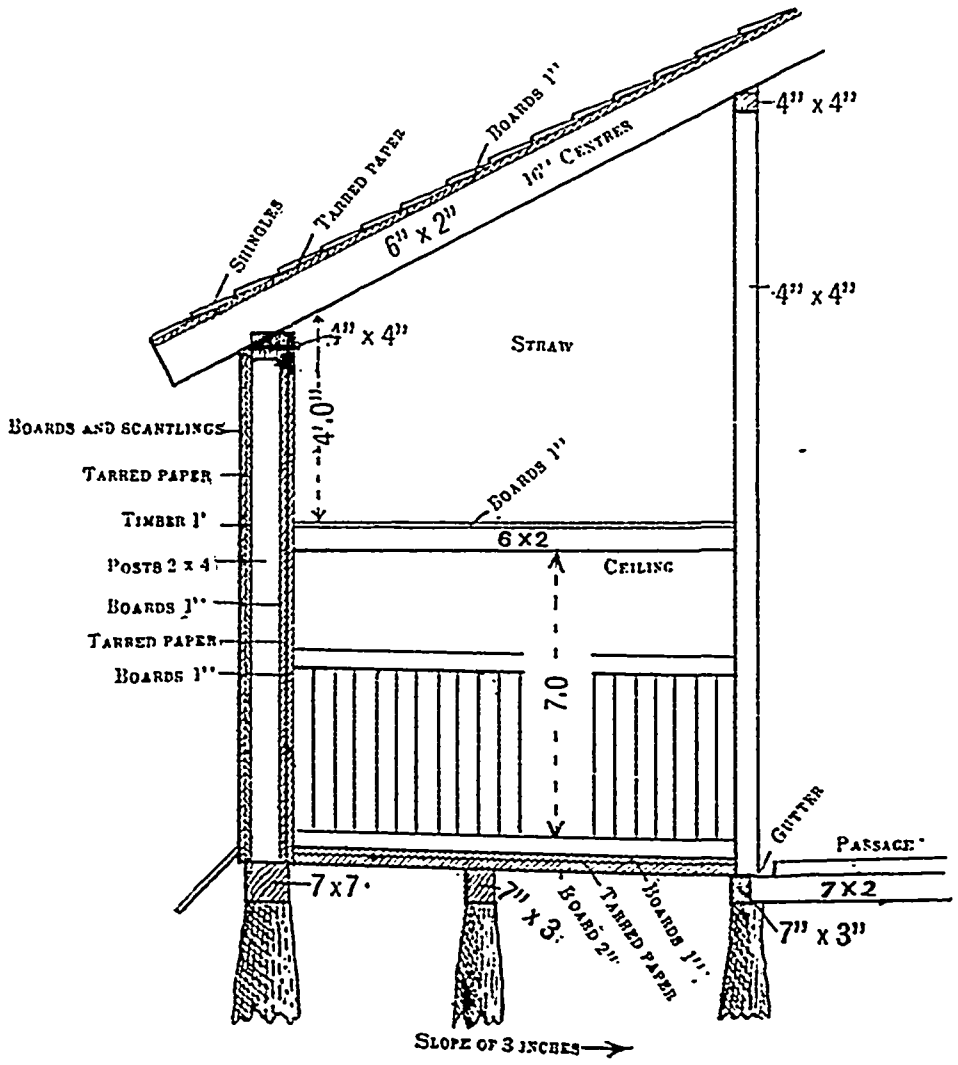
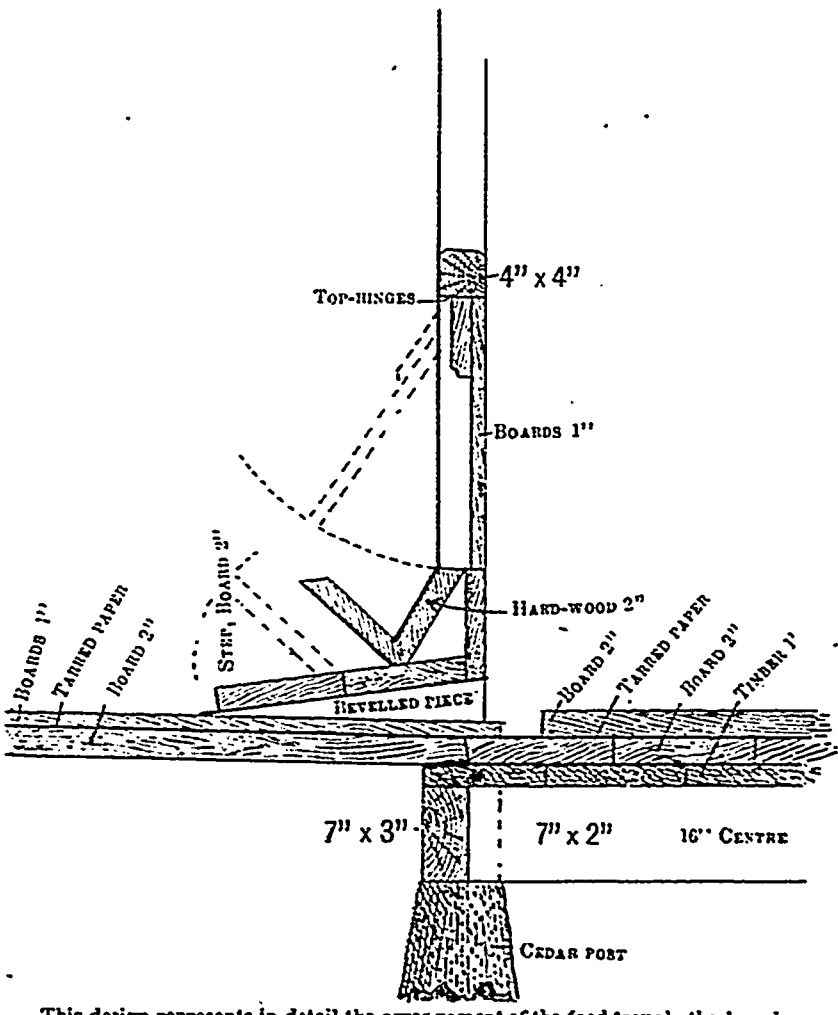


Fig. 4



This design represents in detail the arrangement of the food-trough, the hanging step in front of the trough, the feeding door hanging above the trough, &c. The slope of the floor towards the trough allows the pigs to have a clean bed in the hinder part of each sty.

Household-Matters.

Green-salads—sham-spinach—fashions.

Many people living in the country do not take advantage of what nature provides in abundance. After the long

winter every one longs for something to tempt the appetite, and how gladly one hails the first salad.

In town this is expensive at first, and in the country not easily got, people who are not prejudiced against it will always find a good substitute in the dandelion, when gathered young they are very good, eaten with salad sauce.

Few greens are much better than dandelions when gathered young; cut them free from the root just under the surface, and wash in many waters to prevent grittiness, have nothing to do with them in bloom as they then are quite bitter.

LAMBS' QUARTERS. These are found in the early spring time in great abundance, nearly everywhere, but more often round the buildings or where manure has been It has an oblong leaf, they last quite a long time only the leaf and the tip of the plant are tender.

The quickest way is to pull up the whole plant, strip off the leaves and top and treat just as you would spinach. which it resembles a little in appearance but is of a paler colour. It takes a good lot to make a dish, but will be found very good eating; they last much longer than the dandelion, but are not good for salad.

The greatest care must be taken in washing them as they catch the dust easily.

GOOSE-FOOT. Is another plant of the same species, and will be found in, and about the same place as lambs quarters, they all like plenty of good nourishment, hence the best place to look for them is near or on rich soil, they grow anywhere, but are only to be found in their prime under good surroundings.

The leaf resembles the foot of a goose, hence its name, Goose foot: (1) and very good it is, eat only the leaves and top of the plant, and boil and treat just like the others.

(1) Chenopodium.

If people would only take what nature craves for in the spring, there would be less ailments to contend with

The animals show us a lesson in this by almost fighting for the first blade of grass.

I have grown a pot of grass for my canary during the winter, and one had only to watch, to see how eagerly it was devoured, but the cat found it good, and would steal a march on me and finish up the whole. I had a fern just doing nicely and looking so pretty with grass growing round it as an outer decoration, but pussy found it a dainty dish, and I could not be angry with her for satisfying her cravings at the loss of my plant.

Can we not take a lesson from this and eat what we crave, and is good for us, and can be got for the trouble of gathering.

ILLUSTRATIONS. My little friend, who used to do illustrations for me, being home from school for Easter, made me a couple of sketches shewing the latest styles in hats. In dress and hats green is the prevading colour. I have noticed one very pretty costume,

THE NEW SAILOR HAT.

starting from the hat which was green trimmed with another shade of the same blended with very little colour of any other shade jacket and dress of of any other shade, jacket and dress of two shades; the whole forming a most pleasing costume.

The head is given to shew the present style of dressing the hair; a parting down the front and the hair brought quite over the ear, is only an old fashion revived, though I never remember seeing the little poke or tip of hair behind now necessary to fasten the hat on.

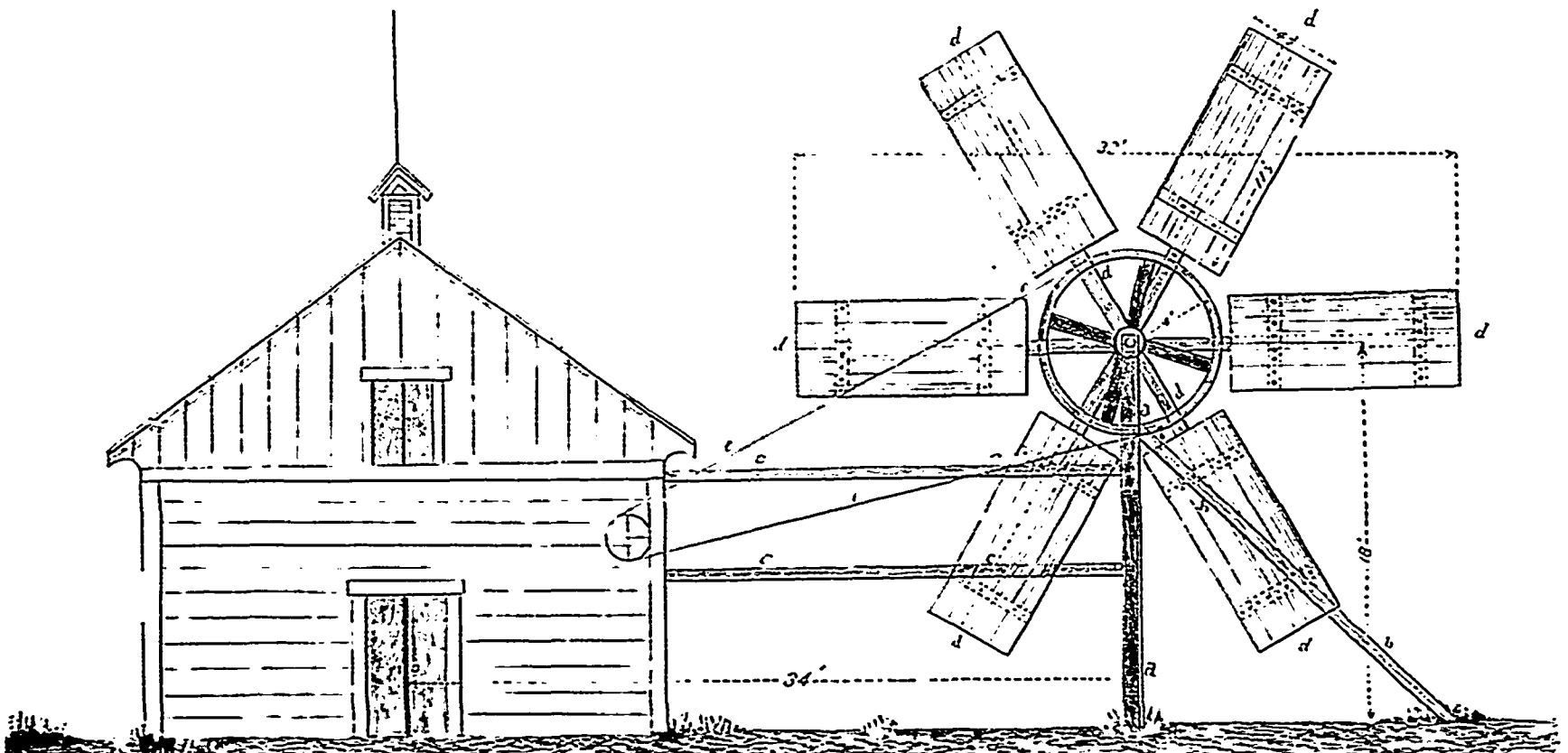
HOW TO TRY ON SHOES.

There are special times and seasons for the trying on of new shoes. A larger pair of shoes is needed in summer than in winter. It is always best to try them on in the latter part of the day. The feet are then at the maximum size. Activity naturally enlarges them or makes them swell. Much standing tends also to enlarge the feet. New shoes should also be tried on over moderately thick stockings. Then you can put on a thinner pair to ease your feet if the shoes seem to be tight. It is remarkable what a difference the stockings make. If they are too large or too small, they will be nearly as uncomfortable as a pair of shoes that are too tight. New shoes can be worn with as much ease as old ones if they are stuffed to the shape of the foot with cloth or paper and patiently sponged with hot water. Or if they pinch in some particular spot a cloth wet with hot water and laid across the place will cause immediate and lasting relief. Milk applied once a week with a soft cloth freshens and preserves boots and shoes.

WALKING FOR HEALTH.

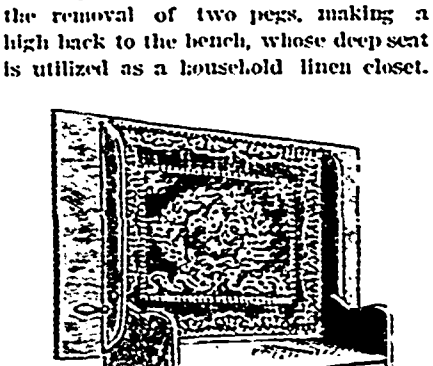
When there is no organic weakness which is aggravated by the exertion, it is the easiest and pleasantest thing to walk right into health. Of course, there is no virtue in a dawdling walk The slow and languid dragging of one foot after the other, which some people call walking, would tire an athlete; it utterly exhausts a week person, and that is the reason why many delicate people think they cannot walk. To derive any benefit from the exercise it is necessary to walk with a light, elastic step, which swings the weight of the body so easily from one leg to the other that its weight is not felt, and which produces a healthy glow, showing that the sluggish blood is stirred to action in the most remote veins. This sort of walking exhilarates the whole body, gives tone to the nerves, and produces just that sort of healthful fatigue which encourages sound, restful sleep.—From "Have You Nervous Prostration ?" in Demorest's Magazine for November.

AN EASILY BUILT WINDMILL.



A SETTEE TABLE.

A settee table of oak has an adjustable top, which can be turned over by the removal of two pegs, making a high back to the bench, whose deep seat is utilized as a household linen closet.



A SETTEE TABLE AS SETTEE.

These tables are in great demand where the saving of space is an object and come in various sizes. They can be purchased without the top and used as a

window seat. One in a pretty studio of a woman artist in New-York was most artistically treated. It was painted a dull green. The back and the lid of the seat where upholstered in an effective gold colored tapestry drawn over a padding of hair and held down by gimp and gilt nails, making a most artistic seat, or table, as it use for either was required. Another one was stained green, and on the back and lid of seat was used natural toned burlap, with stenciled grif fins in dark brown as a decoration.

These tables may be treated in various ways to suit their surroundings. It is suggested in the Decorator and Furnisher that one stained the natural oak and upholstered in green rep, turcoman, corduroy, burlap or denim would be most attractive, or for green substitute brown in the same materials and put on with dull brass nails, making an effective seat for a hall.

Another, painted white and enameled, would be charming in a blue and white dining room. Upholster in dark blue denim with white nails, and fill with a number of pretty pillows in various designs of blue and white, and one of vivid scarlet to give a warm touch, which is needed in these coldly decorated rooms.

The lovely liberty chinzes in dark blue and white, sometimes yellow, red and white on blue, are good to use on these settees, which are first painted black.

W. PLOUGHMAN.

Science.

THE ROTHAMSTED FEEDING EXPERIMENTS.
(Continued.)

Nitrogen in oxen—mineral matter in beasts—fat in sheep, &c.—composition of increase.

Calculation leads to the conclusion that about one-sixth of the whole of the nitrogenous matter of the collective offal parts of oxen, will, on the average, be consumed, but that the whole of the nitrogenous matter reclaimed as food from the offal parts will fall short of the amount contained in the bones of the carcass. So nearly, however, will these quantities balance one another, especially if a portion of the gelatin from the carcass bones be consumed, that it may be assumed that, of the total nitrogenous substance of the bodies of these animals, only about as much as, or very little more than, is represented by the total amount in the carcasses, will be consumed. In the case of pigs, however, a larger proportion of the total nitrogenous substance of the body will be consumed that in that of other animals; but, as the table shows, the percentage of total nitrogenous substance is less and that of the fat much greater in the pig than in the other animals.

Upon the whole, therefore, it would seem that the proportion of the consumed nitrogenous substance will, on the average, be greater than its proportion in the total carcasses of the fattened animals. Such is pretty certainly the case in our own country, but the relations are admittedly far otherwise in the United States, and it is, to say the least, very questionable whether the difference is to the advantage of the consumers in that country.

Lut us now turn to the lower division of Table 68 showing the composition of the entire bodies of the animals, which of course, represents the gross product of the feeding process. It is this, therefore, that is of most interest to the farmer to consider in connection with the composition of the food expended in its production.

As was the case in the carcasses, there is also in the entire bodies a marked diminution in the percentage of mineral matter as the animal matures. Judging from the results of the analyses of the ashes of the animal bodies, it may be stated in general terms that about, or rather more than, 40 per cent of the total mineral matter of the animals is phosphoric acid. In the case of oxen and sheep nearly 45 per cent, and in that of pigs about 40 per cent, will be lime, while of potash, the ash of oxen and sheep nearly 45 per cent, and from 5 to 6 per cent and that of pigs 7 to 8 per cent, or more.

Of total nitrogenous compounds, as well as of total mineral matter, oxen seem to contain, in parallel conditions, a rather higher percentage than sheep, and sheep rather more than pigs. It is seen that the entire body of the fat calf contained about 15¼, that of a moderately fat ox 14½, of a fat lamb 12 1-3, of a fat sheep 12¼, of a very fat one about 11, and of a moderately fattened pig also about 11 per cent of nitrogenous substance. The store or lean animals contained from 2 to 3 per cent more than moderately fat ones.

The figures show, on the other hand, that fat constitutes by far the largest item in the dry or solid matter of the animals, especially of those fit for slaughtering as human food. Even the half fat ox contained about 19 per cent of fat, or more than of nitrogenous substance. The entire body of the store sheep also contained nearly 19 per cent of fat, that is several per cent more than of nitrogenous substance; that of the half-fat old sheep 23½ per cent, or more than one and one-half times as much as of nitrogenous substance; and that of the store pig also more than 23 per cent of fat, and about one and two thirds times as much as of nitrogenous substance.

Of the fattened animals, the entire body of the fat ox contained rather more, and that of the fat lamb rather less, than 30 per cent of fat; that of the fat sheep 35½ per cent, of the very fat sheep 45¾ per cent, and that of the fat calf, however, contained even rather less than 15 per cent of fat.

Thus, the entire bodies, even of store or lean animals, may contain more fat than nitrogenous compounds, while those of fattened animals may contain several times as much. That of the fat ox contained more than twice as much, that of the moderately fat sheep nearly three times, of the very fat sheep more than four times, and of the moderately fattened pig about four times as much fat as nitrogenous substance.

In conclusion on this point, all the experimental evidence concurs in showing that the so-called "fattening" of animal is properly so designated. During the feeding or fattening process, the percentage of the total dry substance of the body is considerably increased, and the fatty matter accumulates in much larger proportion than the nitrogenous substance. It is evident therefore, that the increase of the fattening animal must contain a lower percentage of nitrogenous substance and a higher percentage of both fat and total dry substance, than the entire body of the animal.

It is obvious, however, that the results of the analyses of the 10 animals do not supply data directly applicable for the estimation of the composition of animals in the very various conditions in which they are dealt with in practice, or of their increase over any given period under varying conditions of feeding. Accordingly, we have constructed tables founded on the analytical results above referred to, showing the probable average percentage composition of the different descriptions of animal, each at eight gradationary points from the store to the very fat condition; and the factors thus obtained have been applied for the calculation of the composition of the increase in a number of cases of ordinary practice, or of direct experiment in which the weights of the animals at the commencement and at the conclusion of a fixed period, the general character of the food they consumed, and their final condition were more or less fully known. It is admitted that these eight conditions do not cover all the variations of composition occuring in actual practice; but at the same time there can be no doubt that by the aid of such factors the feeder would be enabled to calculate with sufficient approximation to the truth for all practical purposes, the composition of the store animals he buys or sells, and of the fat ones he sells. At any rate I believe that the results are the best that existing knowledge enables us to provide.

It is impossible to go into any detail here, either as to the composition of the animals at the different stages or to the estimated composition of their increase, but the results may be briefly summarised as follows:

In the case of oxen the figures representing the composition of the animals at different stages of progress show that the percentage of mineral matter ranged from 5.15 in the store to only 3.43 in the very fat condition; that of the nitrogenous substance from 18 in the store to only 13.1 in the very fat state; and that of the fat increased from 11.7 in the store to 37.4 in the very fat condition. Again, the percentage of total dry substance increases from only 34.8 in the store to 54 in the very fat condition. Lastly, the percentage of water decreases from the store to the very fat condition.

The parallel results for sheep show that the percentage of mineral matter ranges from 3.25 in the store to only 2.90 in the very fat animal; the nitrogenous compounds from 15.5 per cent in the store to only 10.9 per cent in the very fat condition, and against these reductions the fat increases from 14.5 per cent in the store to 45.8 per cent in the very fat condition; and the total dry substance from 33.2 per cent to 59.6 per cent. There is, therefore, a lower percentage of total dry substance in the store sheep than in the store ox, owing to the less amount of mineral and nitrogenous matter in the store sheep. There is, on the other hand, a higher percentage of dry substance in the very fat sheep than in the very fat ox, owing to the higher percentage of fat in the sheep. Lastly, in the sheep the percentage of water diminishes from the earliest to the latest stage from 60.8 to only 35.2.

The results relating to the composition of pigs showed a reduction in the percentage of mineral matter from 2.93 in the store to only 1.14 in the very fat condition, and a reduction in that of nitrogenous substance from 14.4 in the store to 9.5 in the very fat state. But, instead of a reduction, there is an increase in the percentage of fat from 18.6 in the store to 51.6, or to more than half the weight of the body, in the very fat condition, and there is an increase in the percentage of total dry substance from 35.0 in the very fat condition, and (excluding contents of stomachs, etc.) a reduction in the percentage of water from 58.0 to 34.4.

It may be observed that in no case do the percentages of total dry substance and of water make up 100; the difference being represented by the contents of stomachs and intestines, the amounts of which found in the animals actually analysed are taken as the basis of the estimates for the amounts in the other conditions, just as in the case of the other constituents of the body.

I will next summarise very briefly the results of the application of these data as to the composition of the animals in different conditions for the purpose of estimating the composition of their increase, in passing from one condition to another.

First, referring to oxen, the composition of their increase during the feeding process has been estimated in the case of the recorded results of actual practical feeding, in some cases of large numbers of animals, and over considerable periods of time. Other cases have been those of results obtained at Rothamsted or under Rothamsted superintendence, mostly in direct feeding experiments, but sometimes in the feeding of animals in the ordinary practice of the farm.

Reviewing the whole of the results, the indication was that the composition of the increase of moderately fattened oxen during a final fattening period of several months will contain about, or a little more than, 1½ per cent of mineral matter; seldom more than 7 to 8 per cent of nitrogenous substance; and seldom as little as 60 and generally near 65 per cent of fat; whilst the total dry substance of the increase will generally range from 70 to 75 per cent. In the case, however, of oxen fattened very young, and the feeding period extending over a much longer time, similar calculations lead to the conclusion that the growing and fattening increase of such animals may contain perhaps 2¼ per cent, or more, of mineral matter, against only about 1½ per cent over a limited final period of more purely fattening increase; about 10 per cent of nitrogenous substance against only 7 to 8 per cent in the only fattening increase, and perhaps only from 50 to 55 per cent of fat against from 60 to 65 per cent in the more exclusively fattening increase. In fact, while the growing and fattening increase would consist of about two-thirds dry substance and one-third water, that of the more purely fattening increase would consist of nearly three-fourths dry substance and only about one-fourth water.

Similar results relating to sheep lead to the conclusion that during a final period of some months of feeding on good fattening food their increase will generally contain not less than 2 per cent of mineral matter, and frequently more, that is, distinctly more than in the case of oxen, the quantity largely depending on the amount of wool. Of nitrogenous substance, the final fattening increase of sheep will probably seldom contain more than 7 per cent and frequently somewhat less. In other words, notwithstanding the large amount of nitrogen in the wool of sheep, their fattening increase will probably generally contain less nitrogenous substance than that of oxen. On the other hand, the increase of well fed and moderately fattened sheep will generally contain nearly and sometimes more than 70 per cent of fat against an average of less than 65 per

cent in the case of oxen and in the case of very fat sheep the percentage of fat in the increase may even reach 75 per cent

Upon the whole it may be assumed that the increase of liberally fed and moderately fattened sheep over several months of final fattening will probably consist of about 2 per cent of mineral matter, about or less than 7 per cent of nitrogenous substance, from 65 to 70 per cent of fat; and in all, of from 75 to 80 per cent of total dry substance; while the increase over the period of excessive fattening may contain from 70 to 75 per cent of fat and from 80 to 85 per cent of total dry substance.

FORMATION OF SOILS, ETC.

What makes the soil.—Effects of rain. —Of frost.—Mechanical division of soils.—Analysis of soils — Organic and inorganic.—Albuminoids.

As the farmer is a manufacturer, so it is necessary that he have a raw material to work upon. In his case the raw material is "the soil"; and ou of it, the farmer's duty is to call into life the various finished products which he carries to market in his carts, or which walk there on their feet.

The soil is the surface of the land, and is of varied composition and of different depths. There are clays, loams, and sandy soils; in some places the parent rock is almost at the surface, in others you may dig for feet or yards, even, without reaching it. Thus, on the soils of the South of England the plough in many places brings up the "chalk" whereas, on the neighbouring "Upper green sand" we frequently find three feet of fine loam before the rock is reached.

Below the soil, by which, in general, is meant the depth of the plough furrow, lies the subsoil, and it is upon the quality of this that the quality of the soil depends. Now, all soils are formed from the breaking up of rocks; not necessarily of the subjacent rocks, for sometimes the materials have been transported for miles by water and other agents, but it may be taken as an axiom, that the 'parent of soil is rock." Bear in mind, please, that "clay," when found, as in the London and Paris beds, in "couches" of great depth, is considered by geologists as "rock."

From these rocks, of various degrees of hardness from the "Serpentine" of Cornwall to the "Bag" of Kent, soils are formed by three active workers: one visible, rain; the other two, carbonic acid and frost, invisible.

We all remember the old proverb: "Constant dropping of water will wear away a stone." As the water falls, in rain, upon a rock, it dissolves parts of it, and carrying those parts away, gives place to the action of future rain after the same fashion.

Referring to the lecture on Meteorology, in the number of this Journal for May, 1895, you will see that the air or atmosphere contains, besides oxygen, and nitrogen, a small proportion of carbonic acid. Now rain, in falling through the air, catches, as in a net, some particles of air, and carries them down in its course to the earth. The oxygen gas, finding itself in comfortable quarters, immediately makes acquaintance with its new neighbours, and finding among them some congenial friends, sets itself to work to form (chemical) combinations with them; which extremely intimate social intercourse ends in the old resident's entire transformation. Carbonic acid, too, being present in the rain, dissolves matters which pure water would have left untouched. Thus, in process of time, holes are formed in the rock, and these become larger and larger, exposing fresh surfaces to be acted upon by renewed supplies of rain.

And now the most mighty agent of the three sets to work. Frost, God's plough, as it has been aptly termed, finds a hole in the rock filled with water: as this water expands by cold it increases in size, and the particles bulk of wet rock are pushed apart to make room for the water which is freezing. When the thaw succeeds, the rigid bands relax, and parts, sometimes large sometimes small, of the rock fall off, and the same agency continuing, are gradually broken up and pulverised. Thus, water, with its associated gases, and frost, abrade our hardest rocks; the lowest forms of vegetation, finding food prepared for them, seize upon the opportunity, and their rootlets, penetrating the newly formed soil, immediately proceed to perform their duty of offering this food to the digestive powers of the plant. Dying, when its course has been run, the original plant is succeeded by others, which in their turn die, and thus, by a species of green manuring, decayed vegetable matter is added to the soil, which by degrees becomes fitted to supply the wants of the higher forms of vegetation.

But, though rocks are, almost invariably, the primary source of soils, we must not imagine that these have been allowed to remain where they were first formed. Were that the case, there would be little difference between the soil and the underlying rock, except that the condition of the former would be finer, or more broken. Many a wonderful change has taken place on the face of our globe: soils have been washed away from their parents rocks, and, mixed with the constituents of other rocks, have been deposited far from their original site in some distant valley. These are the "alluvial" soils, and fortunate is the man whose farm is situated on one of them.

"Peat" is about the only exception to our general rule. It is formed almost entirely of vegetable matter which has grown and decayed in the place where it is found. Peat often contains as much as 97 % of vegeteble matter, consisting of aquatic plants and mosses, and is generally found in hollow places where the water is dammed back Growth succeeds and dies away, its abundance depending upon the supply of water; decaying matter accumulates, and at last the bed of peat begins to show its head above the water; then, tougher, woodier plants establish themselves on the top of the peat, giving that deceptive hard-looking surface to the bog which has led so many men to a sudden death. (1)

"Mechanical division of soils."

The classification of soils is simple enough; sands, clays, and loams; with their subdivisions, as sandy loams, clay loams; and the peculiar ones, as chalk soils, which need not trouble us here, as we have none. I wish we had, for they are very jolly soils to farm; never too wet to plough, never so dry as to parch the crops, and they suit sheep to a nicety.

(1) In 1831, the writer had to be dragged out of a peat-bog, in South Wales, on which he had imprudently ventured when out eel-fishing.

If any one should wish to make a "mechanical" analysis of his soil, he may proceed as follows: With a sieve separate the coarser part, stones, &c., and dry the finer part carefully Take, say, 200 grains of this and mix thoroughly with a half-pint of water, shaking well for a few minutes. Let the mixture repose for a minute, or so, to give the sand a chance to go to the bottom, and then pour off the muddy water into another vessel — pour quickly, and if you think some clay remains with the sand, wash again and proceed as before. You have thus got the two substances in two vessels, and when the super-natant water, which will soon clear itself, is poured off, you may dry and weigh both sand and clay.

The subjoined tables show in what proportion the two materials, sand and clay, are generally found in our soils:

Name of Soil	Percentage of Sand
Sand	80 to 100
Loam	40 to 60
Clay	40 to 20

Again, for the discrimination of "Loams."

Name of Soil	Percentage of Sand
Sand	80 to 100
Sandy Loam.	60 to 80
Loam	40 to 60
Clay Loam...	20 to 40
Clay	20 to 20

I do not think that on this side of the Atlantic we have any real clays, at least, I have never seen any thing stiffer than a clay loam, which, in my opinion is the most valuable of all soils, as "with proper dunging and cultivation" it becomes tender and friable, very retentive of manure, and will grow anything you like to ask it, if, only, you ask in a proper manner. Our Oxford clay, in ploughing which we have seen four powerful horses "stuck," has no equal here.

You see, then, that what we have been in the habit of calling "light land" is heavier than we have thought it; clay being light takes longer to subside in the experiment we have been trying than the sand, which sinks immediately. Thus, when the course of a river is suddenly interrupted by any barrier, we find along its banks, at the highest part, gravel, lower down, sand, and lowest of all, clay, as you may see any day at Chambly, tracing the Richelieu from the *Bassin* up to 'Yule's Bridge."

"Chemical analysis of soils." This is a very different sort of thing, and we do not intend to trouble our readers much with it. Our own opinion is that its study will, eventually be of the greatest possible use to agriculture, but, at present, there is clearly something wanting which nobody seems able to supply, viz. the difference of plant food in an active or passive state. For instance: We do not believe any chemist can tell, from an analysis of a particular soil, whether "potash" will, or will not, benefit that soil. However, numbers of the best men are working away at the various questions involved, and they will sooner or later, arrive at a conclusion.

We all know that soils consist, of two parts: one part which can be burned, and the other that won't burn. The part that is burned does not go out of existence by any means, it is only sent off in its gaseous form; this is the "organic" matter, the remainder is the "inorganic" and remains behind as ashes.

Inorganic Matters in soils.

Silica.	Lime.
Phosphoric Acid.	Ammonia.
Carbonic Acid.	Potash.
Sulphuric Acid.	Soda.
Chlorine.	Magnesia.
Alumina.	Oxide of Iron.

There are other inorganic matters found in the soil, but the above are sufficient for our present purpose.

"Silica" or "silicic acid" play as very important part in the soil. It forms a great proportion of sandstone, and enters largely into the composition of granite and other crystalline rocks. With soda and other alkalies, or with an alkaline earth, it forms "silicates." Clay is a silicate of "alumina," and the fertility of clay soils depends very much upon the presence of a peculiar form of silicate of alumina which we will try to explain, though in the of the numbers of the journal of the absence Royal Agricultural Society in which Professor Way gave his discovery to the world, we fear we shall make a messof it:

To the best of our collection it was this: There exists a class of bodies which way calls 'double silicates." Thus a silicate of alumina may have part of its alumina replaced by an equivalent quantity of lime, soda, potash, or ammonia. So we have a silicate of alumina and lime, another of alumina and potash, and again one of alumina and ammonia. All these double silicates are of great use to our crops, and the strangest thing seems to be, that alumina itself does not enter into the composition of our plants, but contents itself preparing their food, and handing it to them when it is ready for their use. When we come to study the "liming of land" we shall see more about the value of these double silicates.

"Phosphoric Acid" is, we may say, one of the most important constituents of the soil. It enters in large proportion into the formation of every one of our cultivated plants, and forms a great part of the skeleton of every animal. This substance is present in no soil in very great quantity; our most fertile lands seldom containing more than 2.5 per cent, i. e one part in two hundred.

The "organic", or "burnable parts of our soil are, as we have seen, gaseous in form. They consist of substances which have grown under the influence of animal or vegetable life, and have thus become "organized" as part of some living plant or animal. Perishing, as they do, the inorganic matters which had formed part of the animal or plant are added to the mineral matter of the soil, while the organic matter forms a series of substances which practically yield to the soil —Carbon, with Oxygen and Hydrogen, in various forms of combination; and Ammonia with other nitrogenous matters.

The forms which these matters assume are various, but the chemist can detect them under all their disguises, and the knowledge thus obtained enables us to extend our classification of soils beyond the results obtained by our "mechanical" analysis. This determines whether a soil is a sand, a clay, or a loam, but "chemical" analysis determines whether it is calcareous or peaty, that is, rich in lime or in vegetable remains.

"How plants feed — We have only one mouth; a plant has a million, visible only by means of a microscope. Plants, however, do not eat with those tiny mouths—they only breathe, and drink, like a little child, whose only substance is taken in a liquid form: it is necessary to the substance of every plants that its food be dissolved in

water. The first meals are contained, in a solid form, in the seed itself. Take a few grains of barley steeped in water and keep them warm and damp —you will see in a few days that the roots will start from one end, and then the 'plumule,"or green will stalk, start from the other. These could not come into life when dry; but when the food in the grain was liquified and became capable of giving nourishment, the plant immediately took advantage of it, and put forth its infant roots, gradually imbibing all the store, and then, in our case, perishing for lack of further food.

But had the grain of barley been put into the ground, by the time the reserve of nourishment in the grain was exhausted it would have grown accustomed to its environment, and could have found its way to obtain support from the earth itself, until its leaves had sprung forth from the plumule; then the myriad little mouths on the leaves would have gone to work and added a third source of food—the air—to the other two—the seed and water. It is worth anybody's while to go into a "malt-house" and watch the way in which the grain behaves from the first appearance of the root until the "plumule"or"acrospire" has grown half or three quarters of the way up the back, when the "malster" puts it on the "kiln" to stop its growth, lest the green leaf should escape and begin to feed upon the sugar formed in the process.

"What crops are made of."–We have seen that every plant is made up of two sorts of materials: one sort distinguished as organic, the other as inorganic; whereof, if any vegetable matter be carefully burnt, the former vanishes, the latter remains, constituting the ashes The ash left behind consists of mineral matter entirely, and on being submitted to chemical analysis, is found to be a mixture of several kinds of substances, the proportion varying in different sorts of plants. Some varieties of plants contain more of one material than others, and some plants contain more ash than others. The seed and the straw of our grain crops, for instance, contain very different proportions of one of these inorganic matters, silica; but at all events, every one of the substances in our list of inorganic matters is taken up by plants and worked up into their structure, except "alumina, which," as we saw, seems to be a sort of agent to present the food to the plants in an acceptable shape, and not plant food at all.

The "organic" matter, we saw, when the plant was burnt, flew off in a gaseous form; this consists of "carbon" with the elements of water, namely oxygen and hydrogen "acid-maker" and "water maker"; and ammonia and other nitrogenous matters. These exist in plants in a great variety of forms, some easily recognized in one place, but utterly different in appearance in another, and they have been divided by scientific men into two classes; "nitrogenous" and "non-nitrogenous." The compounds containing nitrogen you will always know by their names invariably ending in the letter "n." They are principally these: "Albumen Fibrin" (gluten); "Casein" (legumin). They used to be called "Protein compounds," from their frequent change of form, but "nitrogenous" is a more convenient, because less fanciful, term.

The "non-nitrogenous are Starch: Gum; Sugar; Cellulose" and "woody "fibre;" and "Oil." The difference between the groups is simply this; the non-nitrogenous bodies are composed of carbon, hydrogen, and oxygen, the nitrogenous group contains nitrogen in addition to the carbon, hydrogen and oxygen.

"Starch" is a white granular body, very abundant in grain and potatoes. If you cover a tumbler with a piece of fine muslin or cambric, and wash a little wheat flour on it with a stream of water gently falling as you wash, in a short time the water which reaches the tumbler will become milky, and on being allowed to repose for a short time will deposit a white grainy substance: this is starch. On the muslin cover will be found a glutinous mass, like soft strings of India-rubber; this is the "gluten" of the wheat.

"Gum" you all know by sight—some of you, doubtless, by taste—it is generally in a liquid state in plants, but, exuding through a broken part of the bark of trees, becomes hard and translucid.

"Sugar," too, is found in great quantity in a liquid form in the cane, sorghum, sugar-beet, &c., but it is also present in our cultivated crops, even when not in sufficient abundance to be separated for use. Flowing through the plant with the sap, it promotes growth in many important ways.

"Cellulose," or cellular matter, is so called because with it the plants are built up. When in the incipient state, it is tender and fragile, but when old it becomes hard and strong, and at last becomes "woody fibre. This is the change which takes place in the passage of young grass into over-ripened hay. All these substances are very much alike in composition, and sometimes pass from one form into another, but it is worth remembering that, although the quantity of carbon varies slightly, the weight of oxygen is invariably eight times the weight of hydrogen, and this one of hydrogen to eight of oxygen is—water. Thus, any of these non-nitrogenous matters may be represented as made up, in different proportions of carbon and water, as:

Carbon.	Water.	
50 lbs. with	50 lbs.	make 100 lbs. of woody fibre.
50 lbs. with	37½ lbs.	make 87½ lbs. of humic acid.
50 lbs. with	72½ lbs.	make 122½ cane sugar, starch or gum.
50 lbs. with	56 lbs.	make 106 lbs vinegar.

And, do you ask how woody fibre for instance, can be formed from carbon and water? we answer, thus:

Whereas the root of the plant is continually employed in sucking in liquid food, the million mouths of the leaves are occupied in inhaling gaseous food. Carbonic acid is composed of carbon and oxygen: all day long the leaves are absorbing carbonic acid from the air; the plant appropriates the carbon and rejects the oxygen. Water abounds in the sap of the plant, hence water and carbon are both abundantly present in the pores or vessels of the green leaf. Now as woody fibre consists only of carbon and water chemically combined, it is easy to see how, when these matters meet in the leaf, woody fibre may be produced by their mutual combination.

The three principal nitrogenous bodies we mentioned above, Albumen, Fibrin, and Casein, are very like one another in composition. They are sometimes called "albuminoids" from their leading representative, albumen, which occurs in a nearly pure state in the white of egg. Gluten occurs as we know, in wheat, and is largely composed of fibrin, an albuminoid met with in blood, from which it can be separated by gently beating the blood with a few twigs. Small threads, or fibres will adhere to the twigs, and will consist of the fibrin of the blood. The value of foods depends greatly on the quantity of these albuminoids they contain. "Casein" occurs in the curd of milk, and in pease and beans, when it is termed "legumin," from these plants belonging to the order "leguminosæ". The following tables will show how little these albuminoids differ in composition from one another: Albumen consists of:—

Carbon	5484
Hydrogen	709
Nitrogen	1583
Oxygen with Phosphorus and Sulphur	2224
	10,000

Vegetable fibrin consists of:—

Carbon	5456
Hydrogen	690
Nitrogen	1572
Oxygen with Phosphorus and Sulphur	2282
	10,000

We hope to resume this subject next month.

COMPETITION OF AGRICULTURAL MERIT FOR 1896.

NOTICE.

The Competition of Agricultural Merit will be held in 1896 in the counties of Bagot, Beauharnois, Brome, Chambly, Châteauguay, Compton, Drummond, Huntingdon, Iberville, Laprairie, Missisquoi, Napierville, Richelieu, Richmond, Rouville, Shefford, Sherbrooke, Stanstead, St-Hyacinthe, St-Jean, Verchères et Yamaska.

In accordance with the regulations of the Council of Agriculture, all those desirous of entering into this competition must file their entry in the Department of Agriculture and Colonisation on blank forms that will be sent to them on demand by that Department.

During the last year or two, certain persons asked the judges to inspect their farms after the competition had been opened, under the pretext that they were not aware before that the competition was to be held in their district.

We are anxious that in future, there should be no misunderstanding on this point, so no entry will be received after the lapse of the delays fixed by the regulations of the Council.

The "Lauréats" who obtained the silver-medal and the diploma of The Highest Merit, in 1891, must not forget that, this year, they are entitled to compete anew for the right of winning the gold-medal and the diploma of the Highest Exceptional Merit. Those who, at the above epoch, only won sufficient marks to entitle them to the bronze-medal with the diploma of Great Merit or of Merit, may likewise compete again this year.

FARMERS' SYNDICATE OF THE PROVINCE OF QUEBEC,

Office: 23 St. Louis Street, Quebec.

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General Secretary: Ferd. Audet, N.P.

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Farmers, Agricultural Clubs and Societies can be supplied with every thing they want, viz:

Pigs: Chester, Berkshire, Yorkshire, &c., &c.

Cattle: Canadian, Ayrshire, Jersey, Durham, &c., &c.

Sheep: Shropshire, Lincoln, Oxford, Cotswold, South-down, &c., &c.

Fertilizers and agricultural implements of every kind. Send in your order at once for feed cutters. Farm products of all kind sold for our members Informations of all kind given to members

MARK LANE: *Prices current; April 6th*

	s.	s.
WHEAT, per 504 lbs.; British		
White	27	29
Red	26	28
London flour per 280 lbs	27	—
Barley, foreign	16	44
Malting English	30	36
Grinding	16	21
Oats, English per 8 bushels	15	29
White pease	32	36
FOREIGN.		
Wheat—Manitoba	27	28
Canadian white pease	27	—

London Cattle market, Oct. 14th:

Milch cows, per head.. £15 to £23

BEASTS.	s.	d.
Scotch	4	6
Herefords per stone of 8 lbs	4	4
Welsh (*runts*) " "	4	2
Shorthorns " " "	4	2
Fat cows " " "	3	8
SHEEP.		
Small Downs " "	5	8
Half breds and Scotch " "	5	6
Lambs " "	7	10
Calves " "	5	4
Pigs " "	3	6
BUTTER.	s.	s.
Fresh, (Finest factory) per doz. lbs	11	14
English Dairy-butter, fresh	10	12
Irish (creamery)	112	
Danish	114	
CHEESE.		
Cheshire per 112 lbs	72	76
Cheddar, finest	56	66
BACON.		
Irish	43	
Canadian	36	
Hams, Danish	54	
American	48	
Irish, small	100	
HAY, per load of 2016 lbs		
Prime meadow	84	
" clover	90	
STRAW, per load 1296 lbs		
Best	40	

Hops from 20s. to 70s. per 112 lbs.

Prices of Pigs at Calne.

Present prices for prime pigs, in lots of not less than 10, on rail within 100 miles of Calne:—

Prime Stores.	*Thickness of fat in any part of the back.*	*Price per sc.*
6sc 10lbs to 9sc 19lbs.	2½ inches and under	7s 0d
Under 10sc 10lbs	Not exceeding 2½ in.	6s 6d
Under 11sc 10lbs	Not exceeding 2¾ in.	6s 0d
Under 13sc	Not exceeding 3 in.	6s 0d

Any pigs outside these limits of their value.

Half-truck—12 pigs. Whole truck—25 pigs.

CHAS. & THOS. HARRIS, & Co., Limited, Calne, Wilts, Eng. (1)

(1) Messrs. Harris & Co. do not seem to want only ¾ of an inch on the back as Mr. Laing does!—ED.

The Dairy.

ADVICE TO THE INSPECTORS OF SYNDICATES FOR 1896.

Ex. of syndicates '95—drought of '95 bitter weeds—cheese-swelling microbes—cracked cheese—stamping cheese—temperature of province—butter—fodder-cheese.

We condense the following remarks of Monsieur J. C. Chapais, Asst. Dominion Dairy Commissioner, as contained in the April number of "Le Journal d'Agriculture," on the duties of the Inspectors of Syndicates. We received the original too late to have time to translate the whole.

"There are two special facts that were remarkable in the last season; 1. The exhibition of dairy-products at Montreal in September; II. the great drought that prevailed throughout the entire season over the whole province.

At Chicago all cheese that got 99 marks out of the 100, won a prize, and at Montreal, last fall, the average of marks accorded to the cheeses of the syndicated factories was 89. 6, so that they were all very nearlyworthy of a prize, though they were by no means picked specimens of the best factories as were those at Chicago. If all were not so good, in was due to a single syndicate, whose cheese lost about 20 p. c. of points as regards "aroma." As it is supposable that the 13 syndicates, which did not exhibit, were induced to refrain from showing because they felt they had no chance of winning, it is fair to conclude that one-third of our factories have a great deal to do before their products can be called first-rate. And as it was in the aroma that the chief defect lay, that is evidently the chief point to be attended to. And whence does this defect arise but from bad milk? Hence, it is clear that the "first advice" to be given to the Inspectors is that they should look carefully after the milk; make, themselves, a minute inspection of it at every opportunity; instil into the minds of the makers under their jurisdiction the idea that the watching over the milk is one of their most important duties; as well as to press upon the patrons the necessity of producing only good milk and the best way of ensuring its goodness.

SEASONS OF DROUGHT, like the last, have a great tendency to cause cows to give bad milk. Pastures dried up, but little grass anywhere; these things lead the famished cows to pick up anything, and thus they are driven by hunger to devour many kinds of weeds that they avoid at other times, such as the "bitter ranunculus" (buttercup?) the "wart-wort," and divers weeds of that kind, whence come the injuries the milk suffers, such as redness, bitterness, viscosity, premature souring and curdling; most of which evils caused terrible complaints last season. A list of these weeds has been drawn up and will be distributed to the syndicated factories early in the ensuing season.

HERR FEUDENREICH, a writer on "microbes," tells us that when cows are attacked by inflammation of the udder, it develops in their milk a microbe that causes cheese to swell during its ripening.

Makers, then, should receive instruction from their inspectors to beg the patrons who have cows due to calve in May and June, to watch carefully over them, so that no milk be brought to the factory that has been given by a cow with an inflamed udder.

A remark was made, by one of the judges at the Exhibition, that there was a good deal of "cracked cheese," that is, where the top or bottom of the cheese was split or burst. This fault was not much attended to till last season by the trade. But, in times of depression, as the present, the buyers of dairy-goods try to pick out faults of any kind that they may have an excuse for low bids for cheese really of good quality in spite of apparent defects.

And, now, for my "second piece of advice" to inspectors: how are "cracked" cheese to be avoided?

THE CAUSES THAT PRODUCE THE FAULT.—One of these is that the cheese is allowed to get too cool before being put into the mould. Another is, that the pressure is not increased in regular step by step degrees, particularly when horizontal presses are used, which always require more attention than vertical presses. A third cause is the negligence of some makers, who do not carefully wash—who some times do not wash at all—the cloths put on the cheese, all the time they are in the drying room: a very risky piece of economy.

The bill for the marking or stamping of cheese is now before the House at Ottawa, and will probably pass into law. One part of the duties of the inspector will then be to study it thoroughly and to see that it is carried out in every factory under his surveillance. The date of the making is to be stamped on each cheese, and this, it is feared, will injure some of the factories situated in the Northern part of the province, such as the counties of Ottawa, Argenteuil, Terrebonne, Montcalm, Joliette and St. Maurice, and in all the counties to the North and East of Quebec, where, even in July, the nights are much cooler than in other regions of the province when compared with the day temperature; this of course enables their people to keep their milk in better condition than can those who farm in the South and West of the province, and especially in Ontario. And the figures below prove this:

TEMPERATURE IN

1894	Quebec	London, Ont.
June	61.3	67.0
July	64.6	71.6
August	56.3	64.0

And the difference would be still more between the averages in favour of the above named districts of Quebec.

Must we then renounce the guarantees offered against fraud by this system of stamping the month of fabrication? I do not think so. Let our inspectors this year take the temperature of the districts I have mentioned for the three months, which are reputed to be worst the society in the fall, and give their opinion at the same time on the quality of the cheese made in those three months which are reputed to be worst for making the best cheese. When this has once been settled, it will only take one or two seasons to convince the English dealers that, in those regions, good cheese can be made in those months in which climate compels the makers of the West of the province and Ontario to make cheese of slightly inferior quality.

One of the most important duties of the inspectors is to impress upon the minds of the farmers and of all young men who seem inclined to take up cheese-making, that we already make cheese enough, and that they should devote more attention to butter.

Of the $27,000,000 worth of cheese imported by the English, we furnish 70 p.c.; but of butter, only 2 p. c. of the $65,000,000. We should improve our cheese-making by improving the quality and not by increasing the quantity.

FODDER-CHEESE, in May, should no longer be made at all. It must be inferior in quality, since it is made from cows fed partly in the house, partly in the fields, where at the season the grass is but scanty and the cows can hardly anything but rubbish, weeds, etc.; can milk from such food be good and produce cheese of fine aroma?

Lastly, we recommend our Inspectors to be careful to send their reports in to the Secretary of the Dairymen's Association, with the whole of the details mentioned in the blank forms, for these details are absolutely necessary to enable the society to make out the statistics regarding the state of dairying in the different districts of the province. Unfortunately, too many inspectors neglect this duty."

"From the French."

J. C. CHAPAIS.

HOW SCAB GETS IN ITS WORK

Last month "The Farmer" took occasion to denounce the practice of buying cheap stock with unknown antecedents, and too often parted with by the former owners on account of having been in contact with disease. In this connection the report for 1894 of the Minister of Agriculture just to hand furnishes some very instructive reading. Robert Evans, V. S., Quarantine Inspector at Lethbridge, there reports the work he had in dealing with scabby sheep, and what he learned by tracing each case to the fountain head. Flock after flock had to be dipped, some of them several times, and mercurial ointment had in some cases to be used before the mischief could be checked. The tracing process brought out the fact that a good many farmers had bought out of a flock brought in from Idaho about two years before. It took about a whole year before. It took about a whole year of the inspector's time, and of course a heavy expenditure of public money besides the loss of far more sheep than the total original importation. The labor and expense incurred by dozens of flock owners are also to be added to the bill of expenses. The process by which all this trouble matured is very easy to understand. The original lot was most probably sold because previously in contact with scab, or it may have picked up the disease on its travels. Whether the flock was quarantined for 90 days before being permitted to cross the boundary line is not shown, though it certainly ought to have been, so as to make the chain of history complete. Then a Regina firm of dealers gets them and divides them up. They are next bred without much notice being taken of their skins and the lambs set out on their travels to spread the taint which after all the labor and expense already expended is not yet certainly rooted out. Droves of sheep from across the line have after quarantine proved healthy, but too often the scab has been carried a thousand miles from where it started, carrying loss and trouble all the way. Dakota has suffered far more than the Territories and from exactly the same cause.

Since the above was put in type, "The Farmer" has been advised that a cargo of sheep landed by the "Scotchman" at Liverpool has been found affected by scab and condemned by the veterinary authorities there to immediate slaughter. These sheep were from the Maple Creek and passed by the inspector at Montreal with clean bill of health. The crowding in the voyage had rushed the disease into active development, and this case is pretty certain to lead to an order forbidding the landing of all sheep from this side except for immediate slaughter. The home government will have to do this to conciliate the English farmer, already hard pushed by foreign importations. This case illustrates more fully than any possible arguments the immense difficulty of stamping out scab once it has got a hold. The very dusues become a source of infection.

NOTE.—Since the above was in type, an order in-council by the British government decides that no imported sheep shall be sold in England after Jan. 1, except for slaughter within ten days after landing. (Not so unfair, then, after all. Ed.)—"The N. W. Farmer."

It is a curious fact that the Australasian colonies where merino sheep are counted by millions, are now buying in the English market, rams of the mutton breeds to cross with. This produces more wool and a mutton carcass of much better value than any merino can ever be.—"North West Farmer."

PROF. HENRY ON RAPE.

Farmers may well be suspicious of all agricultural plants which are praised so highly by many agricultural papers, which are very careless about what they say in these matters. The only plant of any real agricultural value, which has come out recently, is the rape plant which is a splendid forage plant for sheep. Last year our people were humbugged by the sacaline plant, which sold for twenty-five cents apiece, and for which the wildest claims were made. We at the Station urged the people to let the plant severely alone. No doubt more money was spent for this one plant by foolish, gullible people than it costs to maintain a state experiment station and the money would have been saved if people had written to their stations to find out.

We can grow in Wisconsin without any trouble, the two grandest agricultural plants in the world, Indian corn and red clover. Corn is practically a sure crop and red clover will never fail if the seed is sown by itself instead of being sown along with a grain crop the way it often is now. I urge our farmers to stand by these two plants, together with those others commonly grown on their farms and only to adopt new ones when they have undergone trials at our experiment stations. As spoken of above, the rape plant is one which has done well with us.

NOTES

Just fancy! Rape a "plant that has come out recently"! A hundred years, at least, ago it was a common plant in England. We ourselves recollect it being universally grown in the S. E. counties 60 years ago and it has never been more generally grown there than it is to-day. In 1872, Mr. Cochrane, Hillhurst, had 20 acres of it—a fine crop—which he cut for his cows, instead of folding it with his Cotswolds. A trip through the English sheep-farms would do the Professors of the U. S. stations no harm.

IMPORTED HAMPSHIRES FOR WYOMING.

That Wyoming wool growers have faith in the sheep business is attested by the big importations of Shropshires and Hampshires this season. Last month we chronicled the arrival of John Mahoney's large importation of Shropshires from the most famous English flocks and this month we are pleased to announce the importation of Hampshires selected by Manager Massey of the Standard Meat and Live Stock Co. The lot comprises 194 ewes and a large number of rams selected from such celebrated breeders as Robert Coles, F. B. Sutton, James Flower, Chas. Walters, Lord Portsmouth, Geo. Read, Mark Wallis, and others. Among the rams is the 300 pound ram "Cambuscan," the great 1895 Royal winner. Besides capturing this highly coveted cup this great ram has carried off five other first prizes this season and has never known defeat. "Chitterne" and "Middleton" are two other noted rams that Mr. Massey purchased at long prices for his Wyoming stud. Wyoming now has two of the largest and finest Hampshire flocks in the United States, Robert Taylor having established the first flock by a choice importation in 1893. We congratulate the Standard Company and the wool growers of Wyoming upon this valuable acquisition to the flocks of their state.—*Ex.*

MUTTON FOR THE TABLE.

It may be that some persons can be found who are not fond of mutton, but if so, their tastes are certainly very strange indeed. Mutton well grown and well fattened is certainly a delicious food, and yet it is not found on the table of many a farmer from the beginning to the end of the year. That it should be so is one of the unaccountable, unexplainable things connected with farm life. The farmer has to raise his own meat in some form. Why should he not raise it in the form of mutton? No kind of meat can be more cheaply raised, and no kind of meat is more wholesome. A small flock of sheep in the summer season lives very largely on waste products on the farm, such as weeds, grass growing in the lanes and fence corners, on the fallow fields, and amid the stubbles, and in the course of a year they put myriads of weeds, and, consequently, of weed seeds out of existence. The larder of the farmer should not be without half a dozen sheep in it during the year, and even though a much larger number should be found there during the course of the season, it should not be looked upon as an extravagance.—"Farming.'

For the "Great Exhibition" was profitable to England. It showed her people that other nations had lessons to teach that it would benefit her to learn; that the smoother manners of the continent engrafted on the homely manners of England made men pleasanter to live with, and that without necessarily vitiating their native habits of thought.

THE GREAT "BRISTISH EMPIRE EXHIBITION."—We are old enough, we almost regret to say, to have a perfect recollection of the "Great Exhibition of 1851. Then, as now, there was a considerable opposition to anything of the sort. One heard all sorts of depreciatory hints, such as: Oh! it never can be ready in time; the whole thing will turn out a failure; and even if it does prove successful, only think what a terrible effect the sudden invasion of a lot of foreigners, will have on the manners and ideas of our people!

We remember the member for Lincoln, Col. Sibthorpe, stating in the House that nothing would tempt him to enter the Crystal Palace, and he boasted to us, the following autumn, that he had never seen the inside of it. As if that made any difference! The Exhibition was, as every one now knows, successful from triumphant *introit* to the almost mournful song of farewell at the close; and we heartily hope the Montreal "British Empire Exhibition" will turn out as profitable to Canada as the original of allthese great shows was to England. (1)

(1) Postsponed to 1897.

Notes and Notices.

As the name indicates, Hall's Vegetable Sicilian Hair Renewer is a renewer of the Hair, including its growth, health, youthful color and beauty. It will please you.

For dyspepsia or stomach derangements, no other remedy can be found so pleasant, prompt and effective as Ayer's Cathartic Pills.