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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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- THE -

Journal of Agriculture and Horticulture

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

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The Farm.

NOTES BY THE WAY.

"Seeding."—We mentioned in our last that the best crop of wheat we ever grew was from a seeding of one bushel (64 lbs.) to the imperial acre; but we reminded our readers that they must not expect such great yields—60 bushels an acre—from such a small quantity of seed unless the land is in the very highest condition, and the cultivation as thoroughly carried out as it was in our case.

A good deal of correspondence is now going on in the "Agricultural Gazette," one of the leading farm-papers in England, on the subject of the quantity of seed-wheat required on all sorts of soils in that county, and the general opinion seems to be that the day of "thin-sowing" is past, meaning, by thin sowing, 3 pecks an acre, as recommended by Alderman Mechi, of Tiptree-farm, Essex, and Mr. Hewitt Davis, of Croydon, Surrey. The latter's farm we looked over in 1849, and found the cultivation carried on in a very praiseworthy manner, though we could not agree with the owner's opinion as to the probable yield of the grain-crops, he putting the oats at 12 quarters (96 bushels) an acre, when there were certainly not more than 80. But, then, we must remember that Hewitt Davis was anxious to extend his connexion as a "land-agent," which would incline him to exaggerate his crops in the statements made in the public prints.

We remember well, in our early boyhood, seeing the farm-steward, on the 1st September, sowing wheat on a summer-fallow, and on being asked how much seed he was putting on, his reply was : "A sack an acre, Sir H.— " ; a sack being, of course, 4 bushels.

We have invariably—in this paper and by word of mouth—advised our farming friends to increase the quantity of seed in proportion to the lateness of the season. We have also advised them to seed poor land more heavily than good land ; land far removea from the dung-cart more heavily than land recently manured. All three of these principles received the strongest confirmation in the following extract from an article in the "Agricultural Gazette" of the 8th October, 1900. Of course, in this country, we must read 20th April for the 1st September, and so on, but the proportion of seed to dates holds good :

It is a question of freedom of growth, both above and below ground. We all know that wheat is capable of stooling or tillering out, and that a wheat plant with a foot space all around it will in favourable seasons fill that space with numerous ear-bearing stems. The amount of seed used per acre ought to depend upon the quality of the land. Good land will produce a good crop from a thin plant ; but bad land requires to be well covered with seedlings. Some persons, who have not sufficiently considered the subject, think that bad land should be thinly seeded, because it is poor and cannot support a big progeny. On the other hand, they think that good land can support a big crop, and they look upon it in the same manner as they look upon a pasture. If a pasture is rich, it will stand stocking hard ; if it is poor, stock must be run thinly over it. They argue similarly upon seeding, and come to the conclusion that thick seeding, like heavy stocking, is suitable for good land. The argument is so misleading, but at the same time so specious, that it is rather difficult to disprove. It is, however, absolutely wrong and palpably absurd. "Bad land is not able to produce "stooling or tillering out of the wheat "plant" ; and hence the plants must be set fairly close together. "On very good "land they may be set wide apart, be-"cause they will fill up the space by till-"ering out." Hence a space between young wheat is not undesirable in good land, but will never be bridged over on poor land. The tillering capabilities of wheat on good land are extraordinary, but they scarcely exist on poor land. On good land one seedling may send up fifty ears on as many stems, while on poor land each seedling may only send up one seed stem. Hence it is clear that on poor land the ground must be well seeded.

Another factor which regulates practice is the period at which wheat is sown. "If wheat were sown in August, which it "often has been, it is possible that 4 pecks "per acre might suffice as well as 6 pecks "sown in September, or 10 pecks sown in "October, or 12 pecks sown in Novem-"ber." It is certain that the earlier the period of sowing the less the quantity of seed required. It is also equally certain that a union of circumstances such as good land and early sowing supply the conditions for the smallest quantity of seed per acre. On rich soil, in a sheltered, low situation, and with August sowing, it is quite possible that 6 gallons, that is 3 pecks, of seed per acre might be quite enough. On the other hand, late sowing must be compensated for by heavier sow-

ing, and this has been measured by a proposed increase of 1 peck a fortnight. Thus the following quantities of wheat seed has been recommended :

On September	1st,	6 pecks per acre (1½ bushel).	
On "	15th,	7 pecks per acre.	
On "	29th,	8 "	
On October	13th,	9 "	
On "	27th,	10 "	
On November	10th,	11 "	
On "	24th,	12 "	(3 bushels).

On high-lying chalk or wold soils it is seldom advisable to sow less than 3 bushels per acre in ordinary circumstances. The attempt to thin seed upon such situations is very likely to result in complete failure.

The situation is not favourable to the experiment, and the result is not to be measured by a few less bushels per acre, but by no crop at all upon the thinly-seeded portion and a harvest of weeds instead of corn.

The above extracts are from the pen of Professor Wrightson, probably the leading "scientifico-practical" farmer in England, now the lamented Sir John Lawes is gone.

According to the usual habit of English farmers of the better class, the following week's "Agricultural Gazette" contained plenty of replies to Prof. Wrightson's queries :

Mr. Fidler, of the Reading farm-school, recommends 2 1-2 bushels of wheat an acre ;

Mr. Nixon, of the Hampshire County Council Farm-School, grew his heaviest crop (64 bushels an acre) with 4 bushels of wheat seed to the acre ;

Mr. Bell has found that the best yields of wheat have come from seedings of 3 bushels an acre. On very poor soils, 4 bushels an acre would probably give a heavier yield than 3 bushels. On good soils 2 bushels will probably produce as many stalks as 4 bushels, in consequence of "stooling out" or "tillering" ; while on poor soil in a low state of fertility, the chances are that only a crop of weeds would be produced.

The same gentleman very sensibly remarks that, in all cases, the size of the seeds of grain and pulse must be attended to in judging of the proper quantity of seed, a point on which we have often insisted when speaking of the sowing of garden pease :

In regards to oats, Professor Wrightson says :—

"When pedigree oats are used the quantities may be simply halved ; for 2 to 2 1-2 bushels of such seed ought to be ample." Now, all seed ought to be pedigreed in the sense that nothing but the very best should ever be sown ; but in this recommendation Professor Wrightson loses sight of a very important fact—viz., that 1 bushel of oats may easily contain 100 per cent. more grains than that of another. For instance, Newmarket oats are nearly double the size of Potato oats ; therefore, it follows that, practically, twice the quantity of the former must be sown to ensure as thick a seeding as that of the latter. During this season the writer has seen, in the counties of Durham and Berwick, Newmarket oats harvested that were sown at the rate of 6 bushels per acre, and "in both districts they were decidedly too thin" ; whilst in adjoining fields—and in one distance in the same field—Potato oats sown at the rate of 4 bushels per acre were excellent crops of sufficient thickness."

The regular correspondent of the same paper from the North-Lonsdale division of Lancashire, states that, in that damp climate, "on a light calcareous soil on the limestone, we have found that for barley, 2 1-2 to 3 imperial bushels, "regulated by the seed-time," and 4 to 5 bushels of oats, give the best return. For wheat (fall wheat, of course), a neighbour sows 4 bushels, and the seedings of the district varies from 3 1-2 to 4 bushels for wheat ; 3 to 3 1-2 for barley ; and 5 to 6 for oats.

Well, such being the quantities of seed used by some of the best farmers in England, and seeing that Britain produces on an average more than twice as much grain to the acre as is yielded, on average by any country on this side of the Atlantic, may we not reasonably suppose that if we were to increase the quantity of our seed we might get our land to yield something nearer to the yields of the English soil ?

To one who has deeply studied the question, both theoretically and practically, it seems indisputable that this would be the best, if not the only way, in which to augment the deplorably small yield of our farms.

"Breeding."—It seems pretty clear, from their annual reports, that the managers of our Agricultural Societies and Farmers' Clubs, have no very fixed ideas as to the

principles on which the breeding of stock of all kinds should be conducted. Were it not so, we should not see the purchases of bulls and other male animals varied as to races and breeds in such a loose fashion.

Every man who begins to establish a herd of cattle, whether for milk or meat; every man who lays the foundation of a flock of sheep, whether chiefly intended for the production of mutton, or for the production of mutton and wool; every man who begins to breed pigs, whether for small pork or for bacon hogs; each and every one of these must, at starting, have formed in his mind some idea of what he wants to produce.

When, in 1700, the Collings aimed at the improvement of the cattle of the Northern counties of England, did they resort to a violent cross of these with the then leading breed, the "Longhorns," as improved by Bakewell? By no means; they began their work by "selection"; picking out the best specimens of the "Teeswaters," they bred from them, and from them alone, choosing in the males such as possessed those points that were likely to correct the faults that were most prominent in the females with whom they were associated.

Mr. Thomas Booth, too, in or about 1790, got his herd of Shorthorns up to their well known pitch of perfection in the same way. The principle on which these early improvers of stock went is the often quoted one; that "like produces like." (We may, perhaps, be forgiven for mentioning that the well framed cows in which Mr. Booth laid the foundation of his herd were bred by Mr. Broader, of Fairholme, Enderby, a tenant of the Editor's gt. grandfather).

"In and in"—"crossing."—Bakewell, the earliest of all improvers, after he had established the type he set out in search of, could never be tempted to make use of a strange animal, however enticing might be its form or quality.

Mr. Booth's reply to the advice of a friend of the writer's, who had advise him to introduce foreign blood into his herd, was conclusive: I will, if you will tell me where to find as good.

The Collings, too, put near relations together: Bolingbroke and Phœnix were brother and sister on the sire's side, and nearly so on the dam's side. They produced the bull Favourite, and he, put to his dam Phœnix, so nearly related to him on the sire's side, produced young Phœnix; she, in turn was put to Favourite, and she, being his daughter and "more than sister," produced Comet, the first thousand guinea bull!

Of course, all this in-and-in breeding was only carried on by these great stockmen so far as to create a fixty of type; they then continued the breeding within the limits of their own herds, but extended gradually the lines of blood, until, as Jonas Webb, of Babraham, the great Southdown and shorthorn breeder told us (in 1852): I never put ram and ewe together nearer than sixth-cousin.

And now that we have seen how carefully the great originators of our grand herds of shorthorns proceeded in the formation of their splendid stock of cattle, we ask if this example of theirs has been followed by the general run of breeders in this country. Many years ago, we wrote, in this periodical, the following words:

"It is not the introduction of one bull that will cure the defects of a whole parish of "runts," that when "fat," as they are called, will die in many cases 280 lbs. to 300 lbs. the carcase. The improvement must be kept up for years by the introduction of pure blood, and we must confess that we do not see much hopes of the necessary capital, enterprise, and skill in this province."

Of course, what we wrote of cattle for the production of butcher's meat is equally true of cattle for the production of butter and cheese.

We hear that it is a common practice among some of the Agricultural Societies and Farmer's Clubs to dodge about from bulls of one breed to bulls of quite a different kind for service in the herds of their members : a shorthorn bull this year, when meat is high in price ; the following season, a Jersey, when dairying is in fashion ; continually ringing the changes from one breed to another, until it becomes a toss-up what the progeny of the " milky mothers of the herd " shall be.

Now this is a most vital mistake. More than twenty years ago, we wrote the following in this self-same periodical :

" There is the well authenticated account of a thoroughbred bay mare, whose pedigree did not contain one ancestor, or ancestress, whose colour was in the least degree mixed with white—gray thoroughbreds being extremely rare, so rare that, during a pretty long experience on the turf, we only remember three or four—. She was, accidentally, served by a beast of a gray carthorse, to the intense disgust of her owner, the upshot of which was that, though the immediate foul was bay, seven succeeding foals got by bay, brown or chestnut racing stallions, had, every one of them, more or less stains of white in their coats ! " To this very day, it is said, dark spots on the muzzles of some of the purest bred of our Shorthorns show the signs of the cross with some Galloway bull perpetrated about 80 years ago.

No, what all Societies should do is to " take a line and stick to it." Suit your stock to your soil ; do not attempt to breed Shorthorns on poor sandy land like Sorel, or Jerseys on farms where there is no pasture worth speaking of ; and when you have got your herd, do not be afraid of paying a good price for a bull if a change seems to be needed. As our lamented friend William Carr wrote many years ago : " When you have experienced the benefit resulting from the use of a high-bred sire, you have next to be convinced of the expediency of " continuing " in the same course."

UNDERDRAINING.

To the Editor of the " Journal of Agriculture."

Dear Sir,—Seeing an article in your " Journal " of the 1st instant, under the above caption, I thought I would try and emphasize it, as I think underdraining one of the most important and at the same time one of the best paying investments a farmer can invest money in, if done judiciously.

I do not see, Mr. Editor, why it is that tiles are so expensive in this Province of Quebec. The only reason I can give for it, is the very limited number used. In Ontario, you can buy 2 and 3 inch tile for $6 to $9 per thousand, while here they cost more than twice that amount !

In " ye olden time," say 40 odd years ago, I have myself assisted in making stone drains on my father's farm, where there were miles of underdrains, it was quite an undertaking. A good deep ditch at least 15 or 16 inches wide at the bottom had to be made, where the soil was easy to dig you could get the ditch dug for 10 to 15 cents per rod, by contract. Sometimes you had to board the man in addition. Then you had to haul stone, anywhere from half a mile to a mile, sometimes even further, side stones of, say 4 to 5 inches high, were used and a flat one on top, then as many small stones as you liked, to fill up the holes if any, and then a sure precaution was to use a little straw on top of the stones and then fill up with dirt.

In this way, a careful made drain in certain soils would last for years, while in some soils the drains would fill up in a few years, especially if you were liable to have muskrats burrowing in them.

I have also made wooden drains using 2 x 3 in scantling for the sides and cover over with a good wide slab, this is much cheaper than the stone-drain, and lasts fairly well. Where lumber is cheap and plenty, I should say this perhaps would be the best, of course the lumber will rot after a time, but where timber or wood of

any kind is always kept wet it lasts longer than where exposed to alternations of wet and drought.

Whenever the farmers take to tile draining, the price will soon fall, and then a great many will be induced to make a trial, as it is now, the cost bars out many who would otherwise give it a fair chance.

The past season ought to convince the most sceptical, that it would pay to drain their soils—for they are at a great advantage over their neighbor who is at times about drowned in water—while again they are at a great advantage—as M. Mortureux shews that underdraining is a safe guard against drought.

It is not very often than any particular thing answers well in opposites—such as a waggon on a dry road goes well while in snow it does not do well at all, in such a case a sleigh would answer much better.

But underdraining dries wet lands and then again enables these same lands to withstand the drought much better than if there was none.

Underdrains especially tile ones do not need much fall to them, they are better to be put in to a good depth for two reasons : first to be sure to escape the frost, and secondly, they have a chance to draw the water from greater distances when deep.

This like many other reforms require to be drilled into people, line upon line, precept upon precept, here a little and there a little. The great hobby with some people is to own a lot of land, but my advice is not to get too much, but what you have make it pay. A small farm well tilled will make more money to a farmer than hundreds of acres only poorly worked. Many men are land poor—and will be to the end of time.

I would suggest to some farmer who has never tried it, to make one short drain in the lowest, wettest part of your farm, take a piece of land almost useless as it were, and see if, in a year or two, you have not made it one of the most productive. Keep strict account of the cost, and then see what interest you will get on your investment : you will be surprised at the result, for you will find that in a very few years it has paid not only the interest on the investment, but the capital too. If you could do so in one piece, why not try it more extensively ?

Hoping these few lines, Mr. Editor, may encourage some one to make a trial.

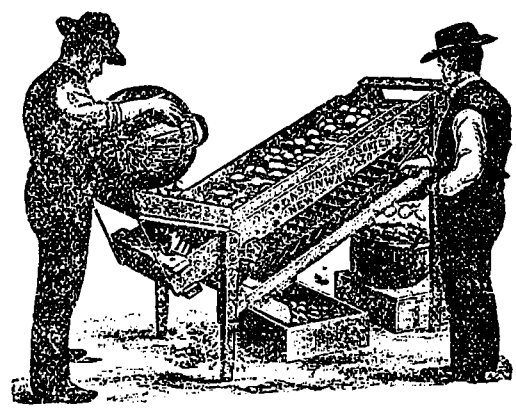
I am yours truly,

PETER MACFARLANE.

October 29th, 1900.

A NEW POTATO SORTER.

The new potato sorter is a radical departure from ordinary methods. As will be seen in the illustration, an elevator with long-distance travel is used, which enables very rapid sorting, combined with excellent work. Another excellent feature is gained in the construction by having the upper down low, making easy work in shovelling and feeding the machine. The



A new potato sorter.

entire work is under the control of the operator and any potatoes which are decayed or ill-shaped may be removed while the work is progressing ; there is no bruising or injuring the potatoes in the least. The machine makes a sorting, or separation, into three sizes, the marketable or large potatoes ; the second sorting, or seed ; and the small, or feed size. The potatoes in each size are sifted thoroughly from the dirt. The capacity of this machine is very great, being upwards of 2,000 bushels per day.

WHY SELL AT A LOW PRICE?

"There is always something the matter with my tobacco crop. I never have good luck with it and have to sell it for one-third to one-half less than growers get in some other sections."

This remark was made to us by a very intelligent farmer the other day. We went to his tobacco barn and found a crop of very fair growth, developing mold simply because it was hung too close and the barn was kept t,ght even in bright, dry weather, when the air should have been allowed the fullest circulation, at least until the cure was nearly completed.

"Have you read the recent articles in our tobacco department on harvesting, curing and handling of tobacco?" we asked. "No," our farmer friend replies, "I haven't had time." "Have you a copy of Myrick's book 'Tobacco Leaf, Its Culture and Cure, Market and Manufacture,' and have you studied carefully the exhaustive chapter on curing?" "Yes, I have the book, but I must admit that I have not read the whole of it or even looked at the part on curing. I doubt if we can learn anything about curing tobacco from books or papers."

Now, my man, if you mean to say that you cannot learn anything from a carefully studied experience of the very best growers and scientists in handling tobacco, you had better quit the business. I reckon from what you frankly admit that your failure to read up even a little on the curing of tobacco every time it is harvested until delivered to the buyer has cost you from $100 to 300, and perhaps more. You say you have bad luck on your crop. That is not the trouble at all. You have not even triedt o master the art of curing and handling cigar leaf tobacco, yet you know it is one of the most delicate and risky of all crops. The men who get a fancy price, which you complain you cannot get, are men who have thoroughly mastered every possible detail of the subject. And yet these men will be the first to admit how little they know about the crop in spite of all their practical experience and scientific study. We regard the tobacco specialists of the Connecticut valley, for instance, as representative of the very highest type of agriculture as yet produced. We know numbers of these men whose knowledge of fertilization exceeds that of most professors of agriculture or fertilizer manufacturers, while their mastery and judgment upon the manifold phases of tobacco culture and curing always command our admiration.

"N.-Eng. Homestead."

SEASONABLE NOTES.

Seed per acre.

I was glad to read the able letters which appeared in these columns last week upon this important subject. Especially was I pleased to have the opinion of Mr. Fidler, of Reading, who has given so much attention to seed corn. As to his suggestion to drill and then cross drill half quantities, the only objection would be time and cost. The idea is that the seed being drilled across, it comes up in squares, and is better able to stand against wind. This would certainly be the case if the squares came up solid like cells of cardboard, mutually supporting each other, and thus making a strong structure. This would not, however, be the case, as the straws would grow up independently, and would not, I think, give any more support to each other than if they were drilled in line. A heavy crop is more liable to go down than a light one in bad weather, although I admit that when the straws stand thick upon the land they mutually support each other.

The question would resolve itself into this: If a crop is drilled from east to west, would a north wind or an east wind, a south wind or a west wind be most likely to throw it down? According to this view the straws would support each other against an east or west wind, because they would be in close contact; and they would be easier blown down by

a north or south wind. It seems rather doubtful whether the idea would be supported by experience.

I know what my own feelings would be. The balance between the number of teams kept, and the amount of work to be accomplished, is too nicely adjusted to allow of drilling being done twice over. One is, in fact, so very pleased to get it done with that there seems no room for putting in practice such a suggestion.

Another point of interest brought out in this correspondence is the superiority of the crops of oats grown by Mr. W. Nixon with the smaller quantities of seed. Four bushels of Garton's Tartar King or Pioneer was, of course, too heavy a seeding per acre. Pedigree seed may at least be used in smaller quantities than ordinary seed; hence it is difficult to see why anyone should have thought of sowing 4 bushels of such seed. Four bushels of oats per acre seems to premise poor land and an exposed situation as well as inferior seed. It is a wonder that the 3 bushels per acre did not show a more commanding superiority over the 4-bushel seeding in the cases of Garton's Tartar King and Pioneer.

It is also noteworthy that a seeding of 2 bushels per acre of Tartar King was not so good in result as was the 3 bushels per acre of the same seed. I am surprised (1) to see that the ordinary Black Tartar, sown at the rate of 4 bushels per acre, gave practically as good a result as the Tartar King and Pioneer. The difference between 62 and 64 bushels per acre is not good enough, and the ordinary Black Tartar is reported to have weighed 36 1-4 lb., while the Tartar King weighed from 36 lb. to 36 3-4 lb. per bushel.

I have heard Tartar King well spoken of this year, and am under the impression that the weight per bushel often considerably exceeds 36 3-4 lb. It shows the disappointing character of the past season if Garton's Tartar King could only give a weight per bushel of 36 lb. We generally sell our oats at 40 lb., and require to add from 1 to 3 lb. per bushel to the natural weight to make up.

SEEDING SIX BUSHELS PER ACRE

Mr. J. P. F. Bell really takes the bun when he relates that this season he has seen in the counties of Durham and Berwick, Newmarket oats harvested that were sown at the rate of six bushels per acre, and in both districts they were decidedly too thin. He, however, informs us that Newmarket oats are nearly double the size of potato oats, and therefore require double seeding. Before I noticed this saving clause I was going to remind Mr. Bell about the county of Durham eggs, which used to be said to be all double yolked. I am, notwithstanding, obliged to Mr. Bell for his note, showing the importance of size of seed in determining the precise amount to be used. In this connection I should like to know Mr. Bell's opinion on the following point—Why are beans and peas usually sown at about the same rate per acre as corn—3 to 4 bushels, although they are of such different sizes, and are both much larger than oats or wheat? This has often struck me as peculiar. Mr. Bell need not disagree with me about my graduated scale of quantities for seeding wheat. I was not aware that I agreed with it myself. I only said, "It had been recommended," and I believe it has. It is impossible to actually produce any scale which can be relied upon in all circumstances; and all rules of agricultural practice should be kept in mind but not forced too much.

The chief reason why agricultural matters are so hard to discuss is because circumstances alter cases to such a degree in agriculture that every case requires to be treated separately.

JOHN WRIGHTSON.

(1) We are not. Ed.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

The small boys have much cause to rejoice at the rare harvest of apples they have got this year for the trouble of gathering, which supply has come from unfenced and abandoned old orchards, and the supply has been almost unlimited, in some parts.

It does one's heart good to see the merry little people go by crunching away, at the same time showing a good supply in the bulging blouse, used freely for the occasion. We all know what a great help towards health fruit is, but it not every year that such an abundant crop comes, so that all can be satisfied. Plenty of fruit and vegetables are a source of help towards the good health of everybody, and if this matter was studied a little more in the bringing up a family, the Doctor would seldom be called in.

Substitute fruit for cakes and many other rich things children are freely given. Many people, who spend money freely in buying all sorts of rich confections, would think twice before spending the same sum on good wholesome fruit, yet the former only serves as a bait to help the lagging appetite, while the latter will guide the whole system into its healthy state.

Fruit can be eaten without cooking, as also can many vegetables, which is sometimes a source of thought to some people, as cooking makes work, and where time is limited, even this has to be thought of in some cases.

Children grow up with the nonsensical idea that they can't, or rather won't eat certain things which are good for them, and conduce so much to their well being; but it needs only a little firmness on the part of those who bring them up to knock all this nonsense out of their heads at a very early age.

Give children that which is for their health and general well doing and insist upon its being taken, within reason, and they will be so much the better for it.

There are people who try hard to carry out the theory of judicious feeding by careful study of serving every day that which conduces the most good to the whole family. In the cold winter-time, beans or pease are served once or twice a week, as every body knows, or ought to know, how helpful and muscle building these often neglected pulse are.

Pea-soup, if well made, contains so many health giving things that the wonder is that more sensible people do not serve it oftener in their families, far better and more easily digested as it is than a piece of frizzled up beef-steak: well made soup contains, besides the pease, onions, carrots, parsley, celery, and a small piece of mildly salted pork. Those who object to the skins of the pease can get rid of them by careful skimming every time the skins comes to the top, which they will do when they begin to burst, the pease being boiled alone till this is over; then, the flavouring should be put in and plenty of time given to cook well, a peep now and then with careful stirring so that the soup shall not burn is all that is needed, except a little water if it thickens too much. (1)

Strange and simple as it seems, there are cooks who will make even this nothing but an unpalatable mess. Talking of fads, I saw a child, only a few days ago, who would never touch this soup, thoroughly converted to a love for it by noticing a friend eating it with the addition of a little potato, since which time she has never refused it; but children are not the only faddists; I saw spinach almost refused, certainly looked upon as doubtful, by a grown-up, because there were poached eggs served on the top, but after a trial, it was pronounced to be very good indeed.

FLANNEL BLOUSES.

During the early autumn flannel blouses become invaluable, and no lady's outfit

(1) Beans and pease are the best cure for constipation. ED.

should be considered complete without two or three of these useful garments. In a month's time we shall of necessity be laying aside the cotton and muslin shirts and blouses, which, although they look so cool and smart in the hot weather, are quite out of keeping when the mornings and evenings get chilly. Elaboration is quite out of place on a flannel blouse, which should rely on its good cut and trim appearance for effect. As to lining, all that is necessary is to get some soft lining such as nuns' veiling, or cambric for the yoke lining, and then leave the lower part and sleeves unlined. Some detachable collars and cuffs should be made of the blouse material, the neck and sleeves of the blouse being finished with plain bands only, so that linen collars and cuffs can be worn if desired. Although for a slim figure an unlined blouse with the fulness gathered to the back and front of the waist looks best, a fuller figure should certainly adopt the tight-fitting lining; cut to about an inch below the waist line, where the draperies should be attached. Such a blouse will not only set better, but at the same time will prove more becoming. Make the waistband of flannel, cover a piece of cotton petersham (1) with it. A waistband like the blouse makes the waist appear much longer than when it is black or matches the skirt. If you doubt my word, just try the effect. I am speaking now more especially to short-waisted women. Choose an unshrinkable flannel; there are several such makes to be had which shrink but the merest trifle or not of all, such as Vivella. These flannels are a little more expensive at first cost, but pay in the long run. For a plain blouse of fancy flannel, about three yards will be required.

PICKLED CABBAGE.

Take a large purple cabbage, and the pickle will be all the more crisp if a frost has touched the leaves of the cabbage. Remove the outside leaves, cut the cabbage in quarters, then into thin shreds across the leaf. The hard part of the stalks is cut away. Sprinkle plentifully with salt, and let it remain twenty-four hours. Drain from the liquor, and wash in cold water; if the water only just covers the cabbage it will, when drained away, determine the quantity of vinegar required. To each quart allow one ounce of peppercorns, quarter of an ounce of mustard seed, a couple of bay leaves, and a quarter of an ounce of allspice. Boil the vinegar with the spices fifteen minutes, and leave to get cold. The shredded cabbage is best made as dry as possible in a cloth; it is then arranged in jars, and the cold vinegar poured over. In a fortnight it will be fit for use.

Pickled cabbage is best made in October or November.

PICCALILLI.

For this pickle the ingredients are: cauliflowers, small onions or shallots, scarlet runners or kidney beans, gherkins, or small cucumbers cut in pieces, vegetable marrows, just as they begin to form, radish pods, before they become tough, nasturtiums, capsicums, or chillies.

To every half-gallon of vinegar add—2 ozs. bruised ginger, 2 ozs. peppercorns, 1-2 oz. allspice, 6 cloves, 1 oz. mustard seed, 2 ozs. mustard, 3-4 oz. turmeric, a stick of grated horseradish, 3 cloves of garlic.

For the brine use a quarter pound of salt to each quart of water, and in this boil, for two minutes only, the gherkins or cucumbers and marrow; when these are removed, add a bit of soda to the brine as big as a nut for each quart; then boil the cauliflowers for two minutes. Cut in sprigs the radish pods and beans. The onions, nasturtiums, or shallots are not boiled. All must be drained, spread upon a cloth, then exposed to the sun and air till quite dry and somewhat wilted. For the pickle, stir the mustard and turmeric into a smooth paste with cold vinegar; boil the rest of the vinegar with the spices, etc., for ten minutes, stirring in the mus-

(1) Invented by Lord Petersham, afterwards Earl of Harrington (about 1770) as sandwiches were by the Earl of Sandwich ED.

tard and turmeric as soon as it commences to boil.

After it is boiled, the vinegar must be covered closely, to keep in its strength, until quite cold, when it may be poured over the vegetables arranged nicely in rather large jars. The spices should not be removed.

The longer piccalilli is kept the better; any way, it should remain untouched for quite a month.

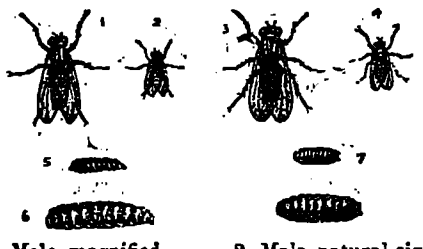
The Garden and Orchard.

(CONDUCTED BY MR. GEO. MOORE).

INSECTS INJURIOUS TO VEGETATION.

(Continued).

MANGEL WURZEL FLY, (*Anthomia betæ*, Curtis).



1. Male, magnified. 2. Male, natural size.
3. Femal-, magnified. 4. Female, natural size.
5. Larva, natural size. 6. Larva, magnified.
7. Pupa, natural size. 8. Pupa, magnified.

Serious injury is often caused to mangel wurzel plants in June and July by the attacks of the mangel wurzel fly. "Anthomyia betae," whose larvae, or maggots, form burrows within the tissues of the leaves, and live upon the juices, weakening and exhausting the plants, and sometimes killing them. After the mangel plants have been singled and begin to show vigorous growth, they sometimes suddenly droop and present a withered appearance. Upon examination, it will be found that there are white blotches, like blisters, upon the leaves, caused by maggots lying within their tissues, from which they have exhausted the juices and extracted the chlorophyll, or green colouring.

Having regard to the harm that is frequently done by this insect to the mangel crop, the following description of the fly in its various stages has been prepared, with information as to remedies that have been found efficacious against it, and precautions that should be taken to prevent its increase.

DESCRIPTION AND LIFE HISTORY.

The mangel wurzel fly is about the size and shape of a common house fly. It is dark grey, with black hairy legs, having yellow feelers, or palpi, with black tips. The femora (thighs) of the female are yellow. The fly is first seen towards the end of May, when it deposits its eggs in groups of two, three, or four, upon the under surface of the leaves of the mangel plants.

Maggots come out from the eggs in fine days, and immediately bore their way through the outer skin, or cuticle, into the leaf tissue, feeding thereon, and moving to another leaf when food fails.

The maggot is about the third of an inch long. In colour it is of a transparent dirty-white, so that the food in the intestines is visible. It has no legs. Its tail end is cut square, but the head is sharp pointed, and furnished with a pair of hooked appendages which serve for boring and cutting into the tissues of the leaves.

The maggot continues in that form for about a month, and during this period does active mischief; it then changes into a pupa, in which case the red, or reddish brown, pupa may be seen, apparently fastened to the leaves, or embedded in their tissues; or the maggot falls to the ground and forms its pupa therein.

From these, the flies come out in about ten days. They are usually three broods. The pupae from the last breed, from which the first generation of flies appear in the spring, pass the winter in the ground, or in decaying leaves and rubbish, or on the roots of weeds and mangels.

REMEDIES.

In the first place, dress the infested plants with nitrate of soda and common

salt, put on at rate of from 1 to 1 1-2 cwt. of nitrate and 2 to 3 cwt. of salt to the acre. This will force the crop along and give it a chance to grow away from its enemies, and if put on with a fine distributing machine would, by resting upon the leaves make them unpleasant to the maggots.

Very finely powdered lime would have a similar effect, and 1 bushel of lime mixed with 3 bushels of soot would be still better.

Washing the plants with paraffin oil and soft soap emulsion, made with soft water, has been also successfully used.

This is made by mixing the oil and soap together in the proportion of 1 gallon of paraffin and half a pound of soft soap to 10 gallons of water, thoroughly incorporated by means of a hand-pump or syringe. The extract of 9 to 10 lbs. of quassia may replace the paraffin oil in this solution, or from 3 to 4 quarts of carbolic acid may be used with 6 lbs. of soft soap and 100 gallons of water.

These compositions can be put on with the ordinary hop-washing engine, with a long hose attached to it ; or with a horse-machine for the distribution of liquid dressings in the form of spray, or of dry substances in the form of powder, upon every part of the plants. A knapsack-machine would be found useful for applying liquids in the case of small holdings.

When the white eggs are discovered upon the leaves of mangel-wurzel plants in infested fields, it would be desirable to apply paraffin and soft soap washes at once to make the foliage unpleasant to the maggots when they are hatched, and thus prevent them from burrowing into the leaves.

Where some of the plants in mangel fields are very seriously attacked, exhibiting many blisters and blotches, they should be pulled up and destroyed, so as to prevent a second brood of flies from being hatched and spreading further mischief. Women could do this work, but they would require careful instruction and direction. It need hardly be said that the plants pulled up must be completely destroyed either by burning or burying them.

PREVENTION.

All the leaves of mangel wurzel plants in infested fields must be carefully collected and burned after the roots have been topped and tailed. On no account should the leaves stripped from infested crops be taken into pastures for cattle during the summer, as is sometimes the custom.

As it is believed that this fly is bred and reared upon dung heaps, it is important that these should be kept turned. (1) Farm yard manure put on for mangels should be ploughed in deeply, and the land well closed by harrow and roller before the mangel is put in.

Many weeds, as some of the thistles (Carduus), sow-thistles (Sonchus), dandelion (Taraxacum), and "Fat Hen" or "Goosefoot" (Chenopodium album), upon which the eggs of this fly are frequently found, serve as harbours for this insect, and should be kept from the neighbourhood of dung heaps and mangel fields.

The common dock is also very subject to the attacks of the mangel wurzel fly, and it is therefore wise to destroy these weeds especially in the neighbourhood of mangels.

NUTS.

The Americans have appointed a commission of experts to study goods and the most economical ways of obtaining them. They are now discussing the value of various nuts which they assert approach the grains in good value and some kinds would be much cheaper than grains if attention were paid to their cultivation.

In France and Italy, chestnuts are consumed in large quantities by the masses of the population simply because they are inexpensive.

No one would suppose how large an item of commerce are nuts in the United States in 1899. Almonds to the value of $1,222,587 were imported ; $625,789 worth

(1) To heat, and so to kill it. Ed.

of cocoanuts; $879,166 worth of other nuts. Total, $2,727,542.

Chestnuts are cultivated on a great scale in France, where the chief moning dish of many of the working classes is a preparation made by steaming the nuts and cooking them with milk and salt. These nuts are also dried, ground into flour and when mixed with water make sweet and nutritious cakes. An excellent soup (1) is also made from chestnuts, they are also used as a stuffing for poultry, and being boiled and dipped in syrup, are a delicious conserve.

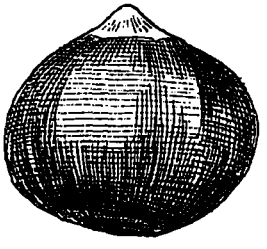
Experts say that, speaking roughly, one pound of nut-kernels furnishes one-half as the same amount of animal heat, as one the same amount of animal heat as one pound of wheat.

Walnuts contain sixty-six per cent of fat, sixteen per cent of starch and seventeen per cent of protein.

The ancient Romans knew walnuts under the name of "Jupiter's Acorus," but they were not introduced into England until the sixteenth century. (1)

Efforts are being made in the United States to increase the size of various native American nuts, and notable success has been already achieved.

What economic results will be obtained from these investigations and experiments remains to be seen, but it would appear that they may be, some time, important, if they materially increase the food supply.

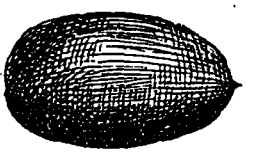


Cultivated chestnut

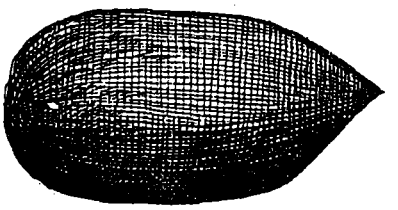
(1) And a porridge, "polenta." ED.

(1) "Walnuts, turkeys, hops and beer,
Came into England all in one year." ED.

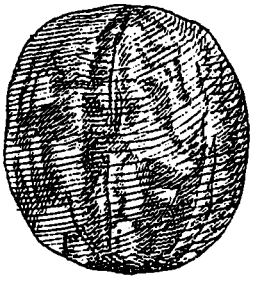
Uncultivated chestnut.



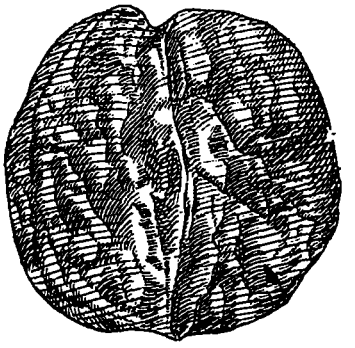
Natural pecan nut.



Cultivated pecan nut.

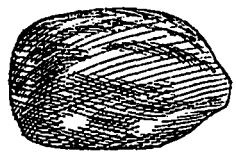


Ordinary walnut.



Cultivated walnut.

Hazel nut.



Cultivated hazel nut. (1)

Diagram showing the improvement in nuts effected by cultivation.

PROPAGATION.

(*Concluded*).

The objects of grafting are to perpetuate and increase rare or choice varieties of trees, shrubs, and fruit trees, also to increase their vigour of growth by engrafting the weak growing kinds upon stocks of more robust and vigorous habit, as, for instance, apples upon crabs, etc.; these weak growing varieties, in some occult way, partake of the habit of the stock; as, for example, weak growing roses, when on their own roots, become strong and floriferous when worked upon the dog rose (Rosa canina) or the Manetir-stock. Scions should be cut before they are required, and kept in a cool place where they will not wither, then, as soon as the sap has commenced its action in the spring, the grafts should be set, and the union between scion and stock will be quickly effected, because the latter is already active in its growth.

It is quite important that the barks of both scion and stock should come in immediate contact with each other, therefore it is preferable that they should be, as nearly as possible, of the same dimensions; but when that is not the case, the scion should not be placed in the middle of the cut of the stock, but one side or the other, so that the barks can touch each other.

There are several methods of grafting: the "wedge," the "saddle," and the "whip and tongue." The wedge is cutting the scion in the shape of a wedge, then spliting the stock, and inserting it in the opening. The "saddle" is the reverse of this, that is to say, cutting the stock in the shape of a wedge, then splitting the scion and placing it upon the stock like a saddle. But the neatest and most satisfactory method is the whip or tongue, this is done by cutting the scion slanting and the stock to correspond, then cutting a little tongue in each and fitting the one into the other, this holds the scion in its place until it can be tied there. The stock and scion should be tied together firmly with a strand of Cuba bass or soft cotton, and then covered with grafting wax to exclude the air until the union is complete. Grafting wax is made by mixing 4 oz. bees wax with 8 oz. of tallow and 4 oz. of resin, boiling them and allowing the mixture to cool, either enough to put on with a brush or, if cooler, with the fingers, which must be greased to prevent the wax from sticking to them. As the object, as before stated, is to exclude the air, care should be taken that the wax completely covers the binding.

Large apple trees may be grafted so as to substitute one variety for another; in that case the limbs having been cut off of suitable size, and situation on the tree, they are split with a grafting chisel, and sprung open by means of a wooden wedge, and kept in this position until the scions, from which the bark has been cut on two sides, can be inserted, (two being generally used, one on each side of the split in the limb), next to the back; the wedge is now removed and the sides of the split limb allowed to spring together; they will keep the scions in their places without any binding, but they should be covered, with grafting wax or clay in which a little cow-dung has been mixed; some prefer the latter because it keeps the wounds cool and moist.

When the grafts begun to grow they should be examined and the grafting wax and binding removed to admit of their growth; at the same time, all suckers and shoots which appear below the graft should be cut off.

Deciduous trees are much more easily grafted than evergreens, and some of these

(1) Which are more like the English *filberts* than the hazel-nut. Ed.

easier than others. Apples succeed best grafted, and plums and cherries fairly, but pears and peaches should be budded.

Enarching is performed by placing two trees together, slicing a piece of bark of a branch of each, tying them firmly together and allowing them to remain so until a union is effected, this used to be done with Camellias, and some other exotics, which it was found difficult to propagate by any other means; but is not much resorted to now.

A skilful, careful, and therefore successful propagator usually commands a larger amount of pay than an ordinary gardener.

GEO. MOORE.

TELEPHONES FOR FARMERS.

Wisconsin has a statute which is likely to encourage experiments in the municipal ownership of a telephone business. The act, passed last winter, authorizes any municipality to issue negotiable bonds, on the petition of a majority of the free-holders, for the establishment and maintenance of a telephone system. Few knew what motive was behind this action; but since it was taken a Farmers' Telephone Company has been incorporated, with a capital of $500,000. This company is offering to establish a telephone plant in any town on a guarantee of 100 subscribers at $12 a year, taking its pay in township bonds drawing 5 per cent. interest and running twenty years, 5 per cent. of the principal to be appropriated yearly to a sinking fund. It is assumed that the income of the lines will pay the operating expenses, maintenance, interest and sinking fund. When the bonds mature, the plant is to become the unincumbered property of the township. It is not stated that any towns have yet taken up with this proposition, but the scheme is a tempting one, unless there are conditions not set forth in the statement of the case before us. A cheap telephone system in a country town would be a great promoter of sociability and contentment in the winter season.

The telephone in many respects is more practically useful in the country than in towns. We have a good telephone service in the Eastern Townships, and at a cheap rate. In some cases, its value is more apparent than in towns. In case of sudden illness the doctor who resides ten miles away can be summoned by telephone and would arrive before a messenger could get to him. I remember a visit paid in the Townships, sometime since, to a farm house, and my hostess used to ring up her mother or sister every morning, and had the comfort of knowing all were well daily before breakfast, although they lived twelve miles away.

A GREAT FARMER.

"My countrymen have learned more from this field than from any other Agricultural Station in the world" was the remark with which an American visitor turned away from a little English Wheat patch.

The field was part of the Agricultural Station at Rothamsted, and the Ameri' cans estimate of its importance was justified by the lessons it had taught.

The recent death of Sir John Bennett Lawes, the founder of the Station, and in a large sense the father of modern scientific farming, closes a simple, wholesome and singularly useful life.

(Youth's Companion).

VALUE OF VEGETABLES AS TO HEALTH

Too much meat and too few vegetables are eaten as a rule, and health may be maintained by a judicious and continuous variety.

Not only are vegetables most wholesome food but many of them render meat palatable. As onions, garlic, (to some tastes) tomatoes, olives, etc.

Their curative properties are also of the greatest importance; not only the herbs which have medicinal qualities are useful in the cure or prevention of disease, but many vegetables which form part of our daily diet. Celery is said to be a sure cure

for rheumatism and neuralgia, and its free use is recommended to rheumatic patients.

Potatoes are wholesome and nutritious, but when baked are more digestible than when boiled. Spinach is valuable in its effect upon the kidneys, and cabbage beneficial in cases of poverty of the blood. Beets and turnips keep the blood pure and improve the appetite.

Tomatoes, taken in moderation, like endive and water-cress, stimulate the health action of the liver. In India, tomatoes are thought to be a preventive of cholera.

Onions are an admirable cure for sleeplessness. (1)

The lady at the head of the household will do well to keep these facts in mind and manage the dietary department accordingly, as by this means she can economize in the food supply, avoid Doctor's fees, and help to keep her dear ones in health.

GEO. MOORE.

The Dairy.

SOME POINTS IN BUTTER MAKING.

As butter is made from milk, and the cow manufactures the milk from the food she eats, it is necessary to provide the cow with sound food. Unsound food makes off-flavoured milk and poor butter. Some cows can manufacture food into milk at a profit, others cannot ; hence the necessity of knowing the individuality of each cow, or her ability to work at a profit to her owner. At this stage of the dairy work, there is no excuse for a dairyman not knowing what each and every cow is doing for him, thus being able to "weed out" the unprofitable ones. Care and cleanliness are required in milking. Remove the milk and aerate in a pure atmosphere as soon as drawn from the cows. If the cream is raised by gratify-process, be careful of the surroundings, as milk will absorb bad odors from decayed vegetables, the hog-pen, the cow-yard, the kerosene-can, a filthy stable, from cooking in the kitchen, and various other sources.

When milk is separated as soon as it is drawn from the cow, this source of danger is removed. Cream from the separator should be cooled immediately to a temperature of 58° ; 55° is better. A cooler that will aerate at the same time it is cooling is very desirable.

When through separating and cooling, temper the cream to the temperature necessary to have it ripen by the time you wish to churn. If it is to be churned the following day this temperature should be 58°–60°. If the second day, 54°—56° provided a suitable starter is used. If it is to stand three to seven days, cool to 40° if possible, as soon as practicable, and hold at that temperature until the day before you wish to churn, when it should be warmed to a temperature that will give the right acidity by the time you wish to churn. This temperature will depend a good deal on the kind of cream, whether separator cream or cream from some gravity process. Cream from shallow setting may be sufficiently ripened when taken from the milk. I recommend the use of Prof. Farrington's acid tablets for testing the acidity of cream. They are a great help to a beginner.

Churn at as low a temperature as you can. This will depend on the per cent of fat in the cream. Rich cream can be churned at a much lower temperature than cream poor in fat. Cream from deep, cold setting may be churned at 58° to 62° ; and thick, rich cream from shallow setting at a much lower temperature, An iron-clad rule cannot be made that will fit all cases. The separator will give cream containing various per cent of fat, from 15 to 40 per cent. Separator cream containing 15 per cent of fat will need to be churned at about the same temperature as deep, cold setting cream. Separator cream containing 40 per cent can be churned at a temperature of 50°, can be gathered at 50°, so the buttermilk will draw at that temperature.

(1) Doubtful : would not we eat lots if they really was ! ED.

A low temperature gives the most exhaustive churning. At this temperature the buttermilk should contain no more fat than the average separator skim-milk. Cream containing a large per cent of fat does not develop acid as fast as cream with more milk in it. Cool the cream for churning about two hours before, so as to let the butter-fat have time to solidify or harden. This gives a more waxy texture to the butter.

Stop the churn when the butter granules are the size of wheat. If the granules are too small there is danger of a loss from them passing through the stainer. Wash no more than is necessary to remove the buttermilk. The colder you churn, the less washing the butter needs, and washing removes some of the delicate flavour and aroma. Remove the water from the churn as soon as possible, as soon as it has done its work. Never allow it to lie and soak unless there is no other way of hardening the butter to a temperature where you can handle it.

Salt to suit your trade. Work once or twice, as you prefer; twice working is preferable, as it makes the nicer appearing butter. Work just enough to remove the mottled or streaked appearance. When worked twice this can be told at the time by the appearance of the butter. When worked but once, it cannot be told until the butter has stood long enough for the salt to dissolve. If worked but once, examine the butter the following day, until you make yourself a rule of thumb to go by. I have found this necessary. I am compelled to look well after this point in my creamery work when the butter is worked but once. Use the kind of butter package that suits your trade, but always let it be neat. Never send a mussy-looking package to market. You cannot afford to do it. Dispose of your butter when fresh, when it will do you credit.

H. WESTON PARRY.

October 30th, 1900.

MILKING.

The following is a translation of a useful article that appeared in the Swedish paper, " Sydsvenska Dagbl. Snallposten "

Milking the cows is a work that is generally not very highly thought of; the maids who do the milking on the large estates or farms are regarded as nearly a caste of their own, standing considerably lower than the other servants of the farm or estate, and when a female servant seeks a service at a small farm, whose owner cannot afford to keep a servant especially on purpose to do the milking, the applicant often makes a condition for accepting the situation that she must not have to do the milking—not because this seems to her too hard work, but because it is too menial. Other people would regard it as a degradation on her part, she fancies. The farmer himself pays, as a rule, little attention and interest to the work of milking. To do it he takes the first best he can get, and leaves it afterwards nearly entirely to themselves to do the work as best they choose or understand. One must be glad to get somebody to do it, we must not be so very particular how it is done. Often the farmer himself does not understand much of the matter; how the milking ought to be done. This contempt for the work of milking, this want of interest for, and this ignorance about such an important work is much to be regretted. For why should this work more than any other respectable duty be thought degrading? It is one of the most important works of the farm, and the way it is looked to and executed is in many respects of great consequence. It has a great influence on the milking power of the cow, upon both the quantity and quality of the milk and butter, upon the health and condition of the animal a.s.o., not to mention of what great importance it is to us in sanitary regard, that the milking be performed with greatest cleanliness possible, and in a manner that answers to the demands of hygiene.

In Denmark the farmers have of late be-

gun to pay more attention to this matter, and have already been able to do not a little towards improvement. Milking matches have been arranged all round the country. Some competent person, with perfect knowledge of the matter, has given short lectures regarding the importance of the milking being well done, and how it is best performed. The "Svendborgs Amts Landokonomiske Selskab" (the Agricultural Society of the County of Svendborg) a couple of years ago arranged a competition for writing a short and popular article about the work of milking. That of Mr. Jorg. Petersen, head-master of the Agricultural College of Dalum at Tyen, got first prize, and some thousands of copies were printed. In Praesto amt (Denmark) there has been formed an "Association for Promoting the Work of Milking." No doubt in this, as in other cases, the way of co-operation is the one to lead to the gaining of the end most speedily and sure. It is not long since this Association was formed. Its aim is shown by its name. The Association will by all appropriate means try to counteract and remove the objection against milking as a degrading work; it will also arrange milking competitions, distribute short instructive articles on the subject, arrange lectures a.s.o., and thus by good and best means seek to educate brisk and qualified milkers, who understand their work and are interested in it. Chiefly according to the before-mentioned little booklet by J. Petersen, we will now see how that work ought to be done.

It is a general rule, appropriate to all living beings, that the use of an organ of the body promotes the development of that organ; this rule is thus also appropriate to the organ of the cow which we call the udder. The use of it is the milking, and in that we have the most important and best means of developing the udder of the cow, and at the same time also her milking power. But in order that the use of an organ may produce a higher development of it, it is also required that it will exert the organ. The exertion of the udder consists of milking it perfectly free from milk. The milker must take as an example the greedy calf, which sucks the very last drop of milk out of the teat. This causes an increase of blood to the glands of the udder, and this is evidently of the greatest importance, knowing that it is from the blood all material for further development and for more milk is got. But, above all, is evident the importance of clean-milking young cows or heifers, the udders of which are still growing and developing. What a good milker has to do, is not only to get out all the milk that is in the udder, but also to do that in such a manner that the cow feels it as an enjoyment, and further to take care no dirt or impurities get into the milk.

Before beginning milking, the milker ought to speak kindly to the cow, pat her and caressingly smooth her along the belly and the udder. The milk pail is then placed under the udder on a certain side of the cow, and he takes, with full hand, hold of two of the teats, one fore and one hind teat to be preferred. The hands are alternately moved upwards to the udder by a gentle pressure, and then, also alternately, slowly and lightly, closed downwards round the teat. These grasping movements are continued till he perceives that the cow yields the milk, when the latter is got out of the udder in long, consistent streams; the movements of the hands are the same as at the beginning, only a little more vigorous. For every new movement the hand must make a pressure up against the udder, and, at the same time, the thumb and forefinger shall seize the part of the udder which is next above the teat, in order to get as much milk as possible from this part where the milk reservoir is the largest.

During this part of the milking the conscientious milker must give all his attention to his work, for every interruption in it means loss of milk. All noise and loud conversation must, therefore, be strongly forbidden during the milking, as disturbing to both cow and milker. When the

first pair of teats no longer yield any milk, he proceeds in the same manner with the second pair. The milk must be squeezed, not pulled, from the teat. The latter must, therefore, as before mentioned, be taken in the whole hand, which must not more than absolutely necessary glide along the teat. " Streak-milking," by which the upper part of the teat is squeezed between the thumb and the forefinger, or, worse still, between the forefinger and the middle finger, and then the fingers, tightly pressed, drawn downwards, is very objectionable. It is disagreeable to the cow, irritates the skin of the teat, and may easily cause sores ; but not only that, it may even cause bursting of the mucous membrane of the milk-cistern, and thereby cause a serious illness in the udder. A hard-handed milking often causes perturbations in the secretion of milk ; in that way a cow may, for instance, become hard-milked ; a teat may from the same cause easily be made quite useless, and the cow become what is called three-quartered.

But milking the cow is not yet completed. An effective after-milking must take place, by which the milker by means of suitable manipulations must work and knead the udder to press the last drops of milk out of the teats. A great many examples could be told about the influence of clean-milking upon the quantity and quality of both milk and butter. In Germany the experiment has been tried of allowing one person to milk five cows during fourteen days, and then another person milk the same cows during the following fourteen days. The cows were fed and served during the whole time in quite the same way. The result, however, was that the second person at an average got about 2 kilograms (4 lb. 6 1-2 oz.) more milk per animal per day than the first one. At a similar experiment made in America by Professor Badcock, Wisconsin, three cows were milked during a week by one person, A ; the following week by another person, B. From the milk A received during this week 11.8 kilograms butter was churned, whilst from the milk B got, only 9.8 kilograms butter was produced, a difference thus of 2 kilograms. (1)

(To be continued).

SHORTHORNS FOR MILK.

Year by year Short Horns have steadily improved their position among milkers, and still more energetic and persevering efforts should be taken to bring the splendid milking capabilities of the shorthorn breed of cattle to the front.

As a meat producer, the shorthorn has long held a premier position amongst British breeds of cattle, and considering the great part it has played in the development of the live-stock industry, the skillful efforts that have been made by breeders, and the wealth which has been expended to make shorthorn cattle put on flesh at the expense—or at least regardlers of milk production, the surprising thing today is that shorthorn cows are so frequently to be met with that can compete as milkers with dairy cows of any other breed.

Considering the history of the breed, and the treatment that pure bred pedigree shorthorns have been subjected to for generations, it is at least not surprising that the milking properties of improved shorthorns greatly vary.

As a rule, the most successful breeders of prize shorthorns have cultivated the fattening to the detriment of the milking property. This naturally resulted in the production of shorthorn cows greatly deficient in milk production. Yet shorthorns being descendants of cattle essentially suitable for the dairy, results show that it has been impossible to breed the milk producing capacity out of them. After all the over feeding for meat and fat, to which the breed has been subjected, the majority, both of pure bred shorthorn cows and of crosses from the breed, are entitled to rank as heavy milkers. Great satisfaction ought therefore, to be felt at

(1) Kil. equals 2 lbs., 3 oz., 4.31 dm. Ed.

the success, which has attended the efforts of the believers in the breed, to bring the milking properties of the shorthorn to the front. In judging cows at cattle shows, special instructions should be given to judges, to make the milking capacity and the form of the udder one of the chief points in awarding prizes to pure bred shorthorn cows or heifers.

I may mention in this connection, as it may not be generally known, that in Australia a dairying grade shorthorn has been reared for generations, the object of which is milk production.

When last in Australia (1) more than twenty years ago, I visited the district where these dairying shorthorns originated in the neighbourhood of Illavarra, south of Lydney, New South Wales. The best milkers of the excellent class of cattle there seen, are said to be descended from a famous bull called Major, belonging to the old Durham breed. This bull was calved during the voyage out. That he was a bull of great potency was proved by the fact that he stamped milking characters of a high order upon his offspring by the common cows of the country. These cows were of course the descendants of importations, and they were mostly of the Durham breed, although Ayrshire blood was also present in some. It is interèsting to notice that the prize takers among these Illavarra dairying grade shorthorns belong to a special type of animal. The colour is commonly red, with patches of white mostly in the region of the underline, though light roans of the finest quality also appear. Professor Wallace has referred, I believe, to these cattle in one of his books of travel, and describes then as being small for shorthorns and comparatively thin fleshed, while in milk, although they get into good condition afterwards. They are well set on their limbs, and have good length of quarters and depth of barrel and of flank. Though by no means too heavy, they are not conspicuously light in the breast and fore-quarters. In general appearance, they are not unlike those bred in England for special milking capacities.

In show-yard milking contests, in the district mentioned above, all animals competing have to be milked three times in twenty-four hours, in the presence of two members of the Committee. The second and third milkings only being weighed.

By this means the true yield for the twenty-four hours is obtained. It is there recorded that a roan cow, which took the first prize the previous year, produced at the milking trial 35 lbs., 35 lbs., and 36 lbs. at the three milkings respectively, or with the first milking set aside 71 lbs. of milk, equal to almost seven imperial gallons, as the produce of twenty-four hours.

This surely speaks well for the breed as milkers.

W. R. GILBERT.

(1) Mr. Gilbert was one of the "All-England Eleven" played against Australia. ED.

Q.—CAN FAT BE FED INTO MILK.

A.—If by this question is meant can the percentage of fat in milk be increased by food fed to the cow, we answer, no. All the constituents of milk come from the food and drink of the cow. The fat of the milk comes from the food indirectly and is thus "fed into the milk," but the ordinary meaning of this question requires us to say that results of the numerous experimentsindicate that "ordinary foods have little or no influence on the percentage of fat in the milk." Experiments quoted in Ex. Station Record, Vol. XI, p. 485, say: "In regard to the fat, the results furnish no indication that the fat of the foods affects the production of fat in the milk." The author concludes that neither the percentage nor the absolute amount of milk fat is dependent upon the fat digested from the food. He believes that some feeding stuffs contain certain materials, which stimulate the lacteal glands to greater activity in some cases, and in other cases so modify the cell activity of the glands that a milk richer in fat is produced.

"Farming."

As usual, the answer to this question is vague. Ed.

LLOYD ON CHEDDAR CHEESE.

(Continued)

Acidity of Curd when ground. — This was estimated 103 times during the season 1897, both as regards solubility in water and solubility in soda. It is not necessary to quote these voluminous figures. It will be sufficient to give merely average results. The object of taking these averages has been to determine whether, when taking a large number of determinations into account, and so eliminating exceptional results, any relation could be found between the acidity of the curd and the acidity of the liquid from the press.

The following table gives the results obtained :

AVERAGE ACIDITY OF CURD WHEN GROUND

	Average Acidity of liquid from press.	Acidity of Curd in Water.	Acidity of Curd in Soda (Casein acidity).
Of 8 samples where the liquid from press contained under ·80 per cent. acid	0·75	0·95	3·47
Of 28 samples where the liquid from press contained under ·90 per cent. acid	8·85	1·05	3·57
Of 38 samples where the liquid from press contained under 1·00 per cent. acid	0·94	1·17	3·68
Of 29 samples where the liquid from press contained over 1·00 per cent. acid	1·94	1·38	8·30

It is evident that the acidity of the curd, soluble either in water or in soda, rises on an average in the same proportion as the acidity of the liquid from press, indeed, appears to be dependent upon the acidity of the liquid which permeates the curd.

It would even appear that the acidity of the casein proper is almost unaltered. For if we deduct from the acidity of the curd in soda the acidity of the liquid from press, we obtain as the true acidity of the casein the following figures, 2·72, 2·72, 2 74, 2 76, which are remarkably similar. These figures indicate that for the practical cheese-maker the acidity of the liquid from the press is an amply sufficient guide to the acidity of the curd when it is placed in the cheese-room.

The last point of importance was whether the acidity of the curd would influence the ripe cheese. It has only been possible to make a few experiments upon this subjects, the results of which are tabulated below.

DATE.	Acidity of Liquid from Press.	Acidity of Curd in Water.	Acidity of Curd in Soda.	Acidity of ripe Cheese in Water.
	Per cent.	Per cent.	Per cent.	Per cent.
April 13	....	1·90	5·05	2·65
" 21	1·00	1·60	4·60	2·35
" 27	·99	1·85	3·80	2·30
May 5	·95	1·00	3·60	2·30
" 7	·97	1·40	3·95	2·85
" 12	·90	1·20	3 80	2·75
" 21	1·07	1·35	3·80	3·00
June 8	1·03	1·25	4·00	3·10
" 24	·84	1·35	3·75	2·98
" 26	1 09	1 35	3·80	3·00
July 1	1·02	1·25	3·65	2·68
" 14	·90	1·20	3·65	2·80
" 24	·93	1·10	3·65	2·68
Aug. 10	1·00	1·20	3·55	2·16
" 17	·91	1·20	3·70	2·34
Sept. 8	·79	·90	3·40	2·16
" 14	·81	·90	3·70	2·16
" 22	·90	·90	3.45	2·16
" 23	·86	·90	3·45	2·34
" 28	·85	·90	3·50	2·34
Oct. 12	·81	·81	3·45	2·34
" 19	·89	·89	3·50	1·98

These results indicate that the acidity of the ripe cheese, as estimated by treatment with water follows most closely the acidity of the liquid from press.

It is evident that both as regards "casein acidities" in the curd, and the acidity of the ripe cheese, there are now and again exceptions to the rule which has been indicated above from the study of averages. These exceptions are, I find, sometimes due to the presence of a particular taint in the curd which invariably causes the liquid from press to show less acidity than was present in the liquid coming from the curd before grinding. Probably other variations are largely due to the proportion of liquid (whey) and of pure casein present in the curd when ground not being constant.

Summarizing the results of these investigations into the acidity of curd, I consider first, that the estimation of the acidity in the liquid draining from the curd is an accurate guide to the acidity of that curd, and will enable the cheese-maker to judge with certainty when the curd is fit to grind; and secondly, that the estimation of the

acidity of the liquid from the press affords a sufficient guide for all practical purposes to the keeping power of a cheese

(To be continued).

LONDON DAIDY-SHOW.

Milking trials.

The following are the numbers of points awarded to the four first-prize cows of each of the named breeds :

Pedigreed Shorthorns.

1.	....	91.5
2.	....	90.8
3.	....	88.7
4.	(Reserve)	85.9

Unpedeyreed Shorthorns.

1.	....	144.1
2.	....	127.1
3.	....	124.6
4.	(Reserve)	120.0

Jerseys.

1.	....	112.0
2.	....	101.0
3.	....	94.9
4.	(Reserve)	90.0

Guernseys.

1.	....	96.9
2.	....	93.3
3.	....	92.5
4.	(Reserve)	88.8

Red-polls.

1.	....	101.1
2.	....	99.1
3.	....	90.2
4.	(Reserve)	86.9

A remarkable result was the large proportion of milks that yielded less far in the evening than in the morning, contrary to the usual rule, owing, probably, to the cows being greatly affected by the heat of the day.

Upon the whole, the tests were not so good as they usually are at this show, either in the quantity of milk yielded or in the contents of that milk in butter-fat.

The best Jersey's butter-yield	was 2 lbs.	2¼ oz.
" " Shorthorn's (unpedigreed)	was 2 lbs.	10¾ oz.
" " Guernsey's	was 1 lb.	12¼ oz.
" " Red-poll's	was 1 lb.	14 oz.
" " Welsh	was 1 lb.	7 oz.

Had the best Shorthorn's milk been as rich in fat as the best Jersey's milk, she would have produced nearly 8 lbs. of butter in the 24 hours !

Milk to butter.

Lord Enfield's Gloaming (Jersey)	13 lbs.
Mrs. Bines's Granny (Dairy Shorthorns)	42 lbs.

Some of the best Cheddars at the show were damaged by the heat, but, eventually, the first prize was adjudged to Mr. Hugh Hunter's Scotch exhibit of a hard texture ; the other prizes went to farmers in the counties of Wilts, Dorset, and Somerset.

The Poultry-Yard.

(CONDUCTED BY S. J. ANDRES).

INCUBATOR POINTERS.

Correct temperature for hatching all varieties of eggs : 103 after the third day; 102 for the first three days.

Run the machine for one or two days before putting in the eggs, or until the heat can be held evenly and regularly at 102.

Don't force the heat up too rapidly at first.

Commence turning on the morning of the second day. Turn the eggs every twelve hours.

Stop turning on the evening of the eighteenth day.

Begin to cool on the fourth day, slightly at first, gradually increasing the time as the hatch advances from ten to thirty minutes, according to outside temperature.

Stop cooling on the eighteenth day.

Use ventilation and moisture as the size of the air cell in the eggs demand.

MANAGEMENT OF AN INCUBATOR

After the machine is in position, firm, and perfectly level, the next duty is to start the lamp. This should have a good wick, neatly trimmed, and the oil used

must be of the best quality; cheap or inferior oil causes bad results and bad tempers. Much depends on the lamp; have this in perfect burning order always, and success will follow. The regulating system must be steady and accurate before an egg is placed in the drawer. It is bad work to start a machine and place eggs in it as soon as the temperature rises to 103 deg. F.; wait for twelve or twenty-four hours to test the steadiness of your regulator.

The proper heat to incubate eggs is as near as possible 103 deg. F.; a little lower, 101 deg., is about the correct temperatures for machines that have tanks over and below the egg-drawer. The instructions sent out with each machine generally give full particulars how to manage and run the incubator properly. Yet there is one thing that some of these instructions do not give, and that is the conditions under which the incubator should be run when placed in a room that is very irregular in temperature. Of course, they all say, "Keep to proper temperature," but that is the difficulty. For instance, you regulate the lamp in the morning; it keeps an even 103 deg. up till (say) 7 or 8 p.m.; then the outside night temperature lowers it to 98 deg. or 99 deg., and in some cases you will find the thermometer in the early morning registering only 75 deg. or 80 deg. Of course, this does not happen to all machines or rooms either; still, one of our best incubators has this fault, for it is made of very light material—in fact, built for a perfect incubator room. Now, we all cannot afford to build rooms with little variation of temperature, so the next best thing to do if our machine falls in temperature during the night is to cover it with rugs or blankets of sufficient thickness to keep the eggs at the proper temperature.

The following temperatures will be found useful to those who use incubators:—

60 degrees F. is the best temperature to keep eggs for setting.

85 degrees F. will start the circulatory system.

95 degrees F. will start the germ growing, and show red blood colour in egg.

120 degrees F. will kill the germ of a duck or hen's egg.

Too low a temperature produces addled eggs; too much heat produces dead birds in egg; and bad ventilation, damp room, too much moisture, uncertain and bad results.

In selecting eggs for the incubator, choose those of a normal size, good shape, as fresh as possible, and from strong, vigorous parents. It is only wasting time, labour, and money to try to hatch a good percentage of healthy chicks from weak parents. The older the eggs the later and more irregular the hatch; the fresher the egg the earlier and more regular the hatch. A week or ten days is the longest eggs should be kept, though eggs will hatch after being kept thirty days if their temperature has not varied much from 60 deg. The strength of the germ weakens after the egg has been kept ten days; besides, it may die in the egg before incubation starts, just as it often does after incubation has commenced.

The Grazier and Breeder.

WINTERING CATTLE.

The profits of the dairy industry have been so large this year that it is to be hoped farmers will treat their cattle during the coming winter months with even a greater care than usual. It must not be forgotten that next year's flow of milk will depend in a large measure upon the condition in which our cows will be when coming out in the spring. "Well wintered is half summered" is the old saying. To winter well, not only good and liberal feeding are necessary, but also good care and good quarters. If the latter are defective, it will certainly not be a waste of time to work at their improvement before the winter sets in.

What constitutes an ideal cow-house? That the cows should be warmly kept while the winter storms are raging out of

doors is certainly an essential point ; but that is not all. There are three things to look for in a cow house : thorough ventilation, abundance of light, and the right temperature. By thorough ventilation, is meant the removal of all foul air and the introduction of fresh air " without draughts," and without lowering too much the temperature. To attain this condition is not an easy task ; but between this perfection and the present condition of a great many of our cow-houses much can be done. Too often, no ventilators are found to provide for the escape of foul air, or those which exist are defective. Ventilators should not consist simply of holes cut in the ceiling ; they should extend from the ceiling through the barn and through the roof, and they should be " straight," otherwise the removal of foul air will not take place properly. They must also be of a size proportionate to the quantity of air which has to escape. If too large, the cold air will descend as well and prevent the ascension of hot air. It should not be forgotten that the foul air is in fact heavier than the surrounding air, owing to the carbonic acid which it contains ; it rises only on account of its higher temperature which causes its expansion. If for some cause its ascension takes place so slowly that it has the time to cool down to the temperature of the air surrounding, it will come down again and accumulate in the stable. Hence the necessity of straight shafts, of the right size, and covered with a cap and Venetian blinds to prevent the entrance of cold air.

It is also necessary to provide for the entrance of fresh air from the outside, to take the place of the foul air escaping, but air-holes should be disposed in such a way as not to create a direct draught on the cattle. It is greatly to be hoped that the system of introducing fresh air by an underground flue—the same as in ripening chambers of cheese factories—which has been adopted and works satisfactorily in a few Ontario farms, will come into use in our country. It is obvious that air introduced in this way will loses much of its chill, so that a greater quantity of air can be introduced without lowering the temperature of the cowhouse.

According to the best authorities, the temperature of the stable should never be below 40° F., and never rise above 60°. For dairy cows, 55° F. constitutes the best temperature, while for young cattle 55° is sufficient.

Too often also, the necessity of an abundant supply of sunlight in the cowhouse is neglected. Sunlight is still the best disinfectant known, and its free admission by numerous windows will be the best preventive against tuberculosis and other contagious diseases.

" Water."—How should the cows be watered ? The following experiment made at the Indiana station seems to be conclusive in this respect : a constant water-supply in the stable caused an increase of 1 lb. of milk per cow daily, or 225 lbs. per year, while the percentage of fat in the milk was the same as before. As to the temperature of the water, Wolf found, at the same station, that when the temperature was reduced from 79° F. to 38° F. the cows fell off 8 per cent in milk yield. We can see that the expense of furnishing our cattle with a constant supply of water in their quarters will be amply repaid in a very short time.

It should not be forgotten too, that even should the cow-house be perfect, exercise is necessary to health and to wholesome milk. The system of covered yards, to exercise the cows in during inclement weather, so strongly advocated by Professor Roberts, has given excellent results wherever it has been adopted. To let the cows out in a cold winter day, under pretence that they need exercise, is certainly not a practice to be followed, but it cannot be denied that exercise under good conditions of temperature cannot fail to have a good effect on their health.

Let us also remember that regularity and kindness, both in feeding and in milking, are of very great importance as regards not only the quantity but also the quality of the milk.

We will endeavor by all means to make our cattle as comfortable as possible during their long winter seclusion : it will pay.

C. M.