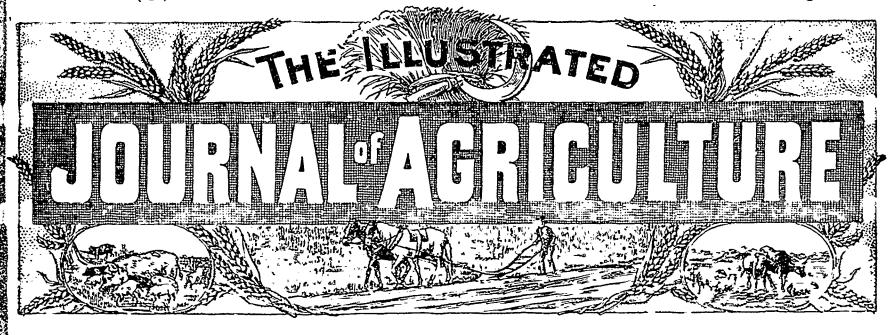
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Vol. 13, No. 12.

MONTREAL, JUNE 1, 1897.

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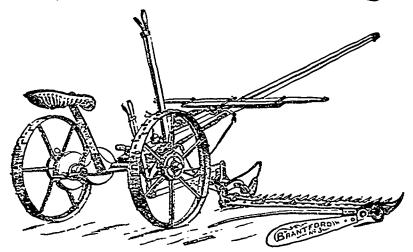
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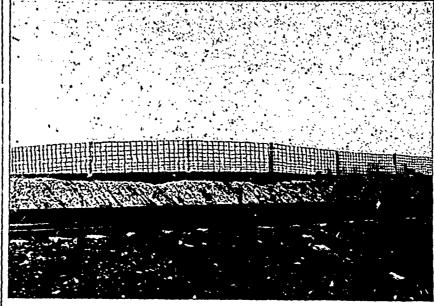
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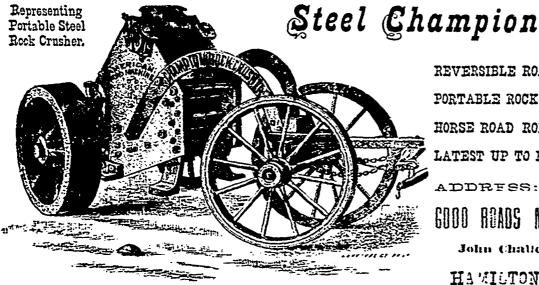
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Another sample is from Messes, McCarron Bros., grocers, of Wallaceburg, Ont., and who also raise thoroughbred cattle. Under date of August 20, 1896, they say, "We fed Herbageum to a Durham calf till it was three months old, when it weighed 476 lbs.". And Mr C. E. Wilkinson, of Essex Centre, Ont., on August 10, 1896, said, "A customer of mine, Mr. Win Sisson, fed a calf with skim mitk, a little chop and Herbageum, at five months old he sold it for \$20"

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THE ILLUSTRATED JOURNAL OF AGRICULTURE is the official organ of the Council of agriculture of the Province of Quebec. It is issued Monthly and it designed to include not only in name, but in fact anything concerned with agriculture, as Stock-Raising therefore the concerned with agriculture, as Stock-Raising

anything concerned with agriculture, as Stock-Raising Horticulture, &c., &c.
All matters relating to the reading columns of the Journal must be addressed to Arthur B. Jenner Pust, Editor of the Journal or Austructures, 4 Lincoln Avenue, Montreal. For subscriptions and advertisements address the Publishers.

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THE ILLUSTRATED

Dournal of Agriculture.

Montreal, June 1, 1897.

The Larm.

FARM-WORK FOR JUNE.

TURNIP AND SWEDE SOWING may, as a rule, be said to begin on the 1st of this month, though sometimes swedes are sown in May, to the weight, doubtless, .ucrease in crop, though the quality ot roots is seldem improved by the early sowing, as the hot sun too the latter part of June, and all through July, is mighty apt to cause taildew This is one of the reasons why swedes, sown under the damp, cloudy skies of the north of England and Scotland, in mid-May, are so much superior to swedes grown in the S. E. countries of England, were we dare not sow before June 10th to 20th. Here, in June, we have seen really monstrous swedes, sown with carrots to mark out the lines for horse hoeing; many of them weighed from 12 lbs. to 15 lbs. without the tops! It is a very good plan, this of adding, say, a quarter of a pound of swede seed to the 5 lbs. of carrot seed required for an arpent. Even well steeped carrot seed takes a long time to come up-parsulp seed we have known to lie five. and even six weeks in the ground-and as swede seed is generally visible the sixtl: or seventh day at latest, if it is sown as shallow as it ought to be, the horsehoe can go to work a week after the seed is sown.

Swedes, in fact all the" cruciforae." or plants of the cabbages kind, should be sown not deeper than % of an inch. and invariably rolled in after being deposited in the ground. On very light solls, though most turnip-drills have a tiny roller attached behind the hopper, it is quite worth while passing a fairly heavy roller after it.

When the drills are set up, or split over the dung, sow at once. All the best turnip-growers in Scotland make it a rule, not to leave one drill that the ploughs have finished unsown when the field is left at night.

The same rule should be followed

when flat culture is pursued. Will any 252 one tell us whether it is or is not bene-Cows at grass...... 253 ficial to a plant, in a hot, dry climate, Imports of Ayrshires 258 to be perched up on a raised drill ? In Southern England, we always drill in swedes and turnips on the flat, and find it far better suited to our climate than the other plan.

If you want swedes for your own table, or for market, do not sow them till the last week of this month. They will not come to a large size, so they can be singled at, say, eight inches apart, and their texture, and therefore flavour, will be much more delicate than the earlier sown ones.

If you want to grow the yellow Aberdeens, a turnip that is hardier than the white, the best time, in this country, is the 20th June, or thereabouts. For ourselves, we must say we would rather have one pound of swedes to one and a quarter pound of acre than 15 tons of yellows.

The best white turnlps we ever grew were sown about the middle of July. on very poor land-sand-and without anything but common village dung. They were fit to pull for the table in less than seven weeks from the day of sowing, and a more delicious vegetable we never ate. It is strange, but true, that, whereas, twelve years ago, it was almost impossible to get a decent dish of white turnips on the Montreal market -Quebec and Sorel swedes are alway: to be had there-,last year we could find any quantity of them. If kept in sand, as carrots should always be, the white turnip will keep sound up to the middle of January; but they must be grown quickly, and sown thickly, so as to be retained within bounds: a turnip more than 4 inches in diameter is seldom worth eating.

When you begin horse-hoeing, go gently; the second time of working it, you may let the knives cut deeper and wider, and when the plants are ready to single, let them in a good depth, and do not be afraid of disturbing the plants on the drills by cutting the earth away from them: two inches, at most, is enough space to leave for them to grow in. This will, of course,make the work of singling all the easier, and if the singler could only be convinced that the proper stroke for the hoe is a stroke at right-angles to the row of plants, we should not hear so much complaint about the trouble that work gives. One good man, and two children to single the bunches, after the man has chopped them out, will easily get over an acre a day. As we have often asked in this journal: If a Scotch woman can single one half of a Scotch acre-5 roods-a day, why cannot singling be done here at a lighter expense of labour, that is commonly the case. Monsieur Séraphin Guèvremont grows never less than ten acres of roots, besides potatoes, a year, and he gets his singling done for \$2.60 an arpent, at most: and it pays him: for, now, instead of being obliged to send his roots up to Montreal market, he is keeping them at home for his cows, and finds that root-growing and cow-keeping are decidedly profitable things. How well we recollect his cousin, M. Pierre Gudvremont. telling us that it could not pay to grow roots, since a-half acre of carrots, that he had tried on his father's farm, cost ten dollars to single! Allowing 800 bushels,-18 tons, to be a fair crop of swedes; and Mr. Guèvrement has often

bushels to the acre: at the above rate, each bushel would cost rather more than one-third of a cent to single!

As to sowing RAPE, that can be done at any time, but we must again strongly insist that the proper way to sow it. in a country where latour is source, is broadcast, at the rate of 6 or 7 lbs. to the acre-rather less to the arpent.

The land should be thoroughly worked, after the ploughing, with grubb,r and harrow, and chain-harrowed or bish harrowed after the seed is sown. The roller finishes the job. No hoeing is required; only, if the land is a little crusted, after a heavy rain followed by a hot sun, when the plants are well up, a couple of tines with the harrow will break the crust and start the rape lato fresh growth. Every farmer who has a score of sheep should have two or easier to grow 20 tons of swedes to the Nothing court to state of this most fattening plant. and pease mixed, to finish off the late lambs, and to prepare the ewes for the ram, if twins are desired; to say nothing of the benefits the land derives from the solidification it receives from the treading of the sheep and their droppings. Very little, too, d.es this plant require in the form of manure. Four or five cwt. of East India bonemeal is sufficient for an arpent, at a cost of about \$5.00, and broadcasting that, by hand, is not a costly job. Only think; you, at least most of you, have. at the end of your farms, farthest from the cattle-sheds, a few acres that never see the dung-cart, and with this system of rape and sheep they hardly need see it: for a treatment such as this will assuredly, if anything like certainty can be predicated in agriculture, bring a crop of grain and two of hay, after which, a top-dressing of a little dung composted with lots of ditch-scrapings. etc., should give another crop of hay. followed by a couple of season's pisture, and oats after the grazing is done with: an eight year rotation at a very triding expense.

> CARROTS.-We are still old-fashioned enough to prefer the white Belgian to any other sort of carrot for stock. It is, in our opinion, by far the most productive of all the sorts, as for the quality, a man must be pissessed of very penetrative discrimination who can see any difference between the feeding effects of this when compared with any other carrot. Another thing: there is no trouble about digging it; if the horse-hoeing has been properly done; I. e., up to the very edge of the lines of roots: the Belgians come out of the ground at harvest with a very slight

> HORSE-HOEING ROOTS. - The skallow horse-hoeing of corn is constantly being insisted upon by americar. writers on this crop, and with perfect propriety. The main thing to be attended to with this plant is its ripening; consequently. anything that delays that most desirable disposition must be arcilled: cutting the roots of a plant does delay its maturity, therefore horse-hoe corn shallow.

> But with roots it is perfectly immaterial whether they mature or not. The land is certainly improved by deep-stirring; therefore, horse-hoe roots as deeply as possible.

The reason why cutting the roots of grow 2 1200 and, once, at least 1500 a plant delays maturity is simply this: Nature, finding a root cut, imm diately in excrementitious form, before it is sets to work to repair the b each, and, as a compensation, causes three or four fresh rootlets to form in place of the original one, and deveting her attention to this renovation, neglects her other duty of, looking after the maturation of the secd.

It was Hugh Raynbird, an F glish stems of the cabbages. As for catting the roots, that some people avoid so out off, four or five new ones will immediately begin to form.

POTATOES.-We were glad to see, last year, that the practice of earthing up potatoes, to the absurd height that used to be the custom here, is gradually departing. A slight earthing up is, perhaps, needed to keep the upper tubers from the light that turns them green; but the less earth that is piled upon Jouble-mould board-plough through the intervals between the rows: a lesson in itself to any observant former.

MANGLES need no piling up of earth around them, neither do swedes. nor any other roots, except sugar-beets; but, then, the last grow under ground, and it seems, as we learn from ex. erts. that earthing up the sugar-beet has some influence; mysterious to us; in that the fences of their enclosure are increasing the percentage of sugar in sound. Do not be satisfied unless each that plant.

Scotland, and, doubtless was necess ry rowed in the latter end of August, or there, in the undrained state of the beginning of September, can be land; but, from all we hear, from late; visitors to that well-farmed country, the practice obtains no longer.

scour on the grass: cotton seed-cake nesed upon them of volding their food, nes.

more than half digested.

In pasturing, as we have said twenty times or oftoner in this paper, 50 acres in 5 fields are as productive as one field of 60 acres. You like a clean of te for each dish, at your own dinners, and you may depend upon it your cow does not like nosing over the same old pas farmer, who first let us into this secret. ture, day after day, trying to find a Speaking of cabbages, in an e-say in bite, that does not exude the stench of root growing, published in an early the stale and fetid breath of dozens of number of the R. A. Soc. of England's cattle that have preceded her over the magazine, he says: Horse-hoe as often grass. It is all very fine, and pre-tily as possible, and do it close up to the poetical, to write about the sweet scent of the cow's breath to the human nostril; but, it is most prob ble that much, that will not to any harm, for it has not the same delightful fragrance where one root, or rather rootlet, is in the nostrils of her sister kine, or else, how can one account for the repulsion a well fed animal exhibits when offered the leavings at the bottom of a manger previously occupied by another of the same species.

THE CALVES, too, need great attention, to obviate the effects of cold rains and winds, this morth. when they first go to grass. Diarrhoea claims, and obtains, its victhem, the better. Keep the horse-hoe tims by the score, among the cal-going, as deeply as possible, until the ves of some of our most careless ves of some of our most careless tubers begin to form, and then pass the farmers, and nothing but prompt attention will prevent it from proceedthem once, making the raised surface as ing to the more fatal form of dysen-broad as possible, so as not to confine tery. A bottle of "Dwight's Cholera the roots too much, but to give them Mixture," to be obtained at any drug-plenty of space to seek their food in, gist's shop, is, to our own knowledge. What can be the use of giving potatoes, the safest and best remedy, and should 27 intervals between tile rows, and be always kept at hand. But, as prethen earthing their feeders up in a vention is better than cure, keep your space of rarely more than 15 inches? calves under shelter until the weather "Indian corn" needs no earthing up looks propitious, and do not delay get-at all, as any one may see, after a ting them home from pasture directly violent storm of wind and rain; when cold winds and rain begin to dethe storm is over, the bent-over times clare themselves. As a general rule, the soon straighten themselves, and the roots is a may be safely trusted to take every rough shaking about of the roots is a benefit rather than an in mry; almost care of the young calves and lambs, as good as a thorough hand being in when the men are, either from press of loosening the earth about them. If work or from absence at market, away loosening the earth about them. If work or from absence at market, away your corn has been or porly h rechood, from the homestead; still, the eye of you will find its roots interfacing each the master himself should be over the other, in a web-like form, all across, whole of the younglings at least twice a day.

No particular attention is required by the SWINE this month, except to see that they have plenty of water and food, that those who are pasturing in the cloverfield are well ringed, and of your sows brings you two farrows The practice of carthing up roots yearly; one in spring and the other had its origin in the damp clim to of in early autumn. The fall litter if fareasily made fit for "roast pork" by the middle of December; for a well bred pig properly fed on meal and skim-milk, should weigh, dressed, ten London stone, that is \$0 lbs., at 13 weeks old. CATTLE.-In the flush of the grass In England, where we used to feed from that is everywhere prevalent during this 100 to 120 pigs for the West-end of month, it may not be absolutely necessary London trade, we have often had them sary to give the milch cows any extra make 8 lbs., a week from birth. Refood; but, when pastures leg n to got member that, as lean pig-meat is in bare, and the milk begins to fall off, request at the present time, pease are were it never so little, make up your the best food for the purpose of making mind to spend a little money in the pur-such meat; not pease alone, of course, chase of cotton seed-cake. You all but mixed with other grain, barley or know, too, how, in a wet time, ca.tle corn for choice. Whey is useful in its place, and science indicates that, as the will soon stop this complaint, a great cheese has absorbed the greater part of weakener of any kind of stock, but the mitrogenous matters of the milk, the especially of cows giving milk, who vacancy should be supplied by some have enough to do to fill the pail, other food containing nitrogen in abunwithout having the extra trouble im- dance; and, here again comes in the have but an idle time of it and are if such would learn to appreciate these

THE FLOCK. - If you turn sheep, cows, and horses into the same pasture, you must expect to find it soon give out. Cows like a good long bite, round which they can lab their tongues; horses feed low; and sheep grub up the roots of the clovers and other soon make the pasture pretty bare. But, if you have a few pieces of successively sown vetches, etc., to mow for the horses, when in bloom, and plenty of early sown rape for the sheep, the cows and other horned stock can have the pasture for their own needs, and it will be all the better for the absence of the others.

The lambs are getting pretty big now, corner of the field, where they can have these young things; but oats do well. far better than corn, for them. All grain and pulse are cheap enough; artificial manures, on the contrary, are very dear,-absurdly dear when compared with their cost in Eng'and-so why not make the cheap food act in a double form; first, as an increaser of the careass of your lamb; secondly as a manure of your land? The ewes are probably beginning to shrink in their milk, and, when that is the case, the lambs must suffer. Really good mutton is greatly in request in all our great towns, as well as in England, and it is high time we began to cease treating our sheep like some vile wool-bearing creature, whose carcass is merely a frame, on which to hang the jacket. It was really shocking to an old breeder of Downs, like ourselves, to see, last fall, the miserable little cats of things, weighing, many of them, not more than 25 lbs. the carcass, that some of our leading Montreal butchers, in Ste. Catherine street, were not ashamed to send in to their customers. It can pay nohody the breed such rubbish; but their dams, put to a good Hampshire-down, a Shropshire, or an Oxford ram, would turn out something a good deal better. and the dose repeated with the crossbred ewes of the next generation, the progeny would be something like mutton.

It is very much to be feared that, as in some parts of the country the rain-lambs intended for the fall-market are never castrated, and as a lamb att four months old is quite capable of generation; it is greatly to be feared, we say, that many of the ewes are got with lamb by these very immature creatures; and what can be expected of such careless breeding as this but a rapilly degenerating stock.

We have made, in this province, vast our herds; but the management of our that some one would take up in earnest the breeding of good short-woolled sheep for market! Not breeding for buyers; of rams, for there are several gentlemen, both here and in Ontario, who tura out splendid rams; but ordinary farmers we mean; men who breed for the butcher and his customers, and who would be ashamed to offer for sale eight months old lambs, the carcass of which would weigh less than 60 lbs.

THE HORSES are supposed to be at is surrounded. work all this month, as they should be, but where no roots are grown, they surd to a certain class of readers; but, turned out to graze. This is but an blessings it would make them more con-

unremunerative mode of treatment of those useful animals; they had better be at work. For, if proper foresight be exercised, there is plenty for them to do, especially on heavy land farm-. If there is no employment for them in putting in the root-crop, there must be delicate plants; so, the lot of them will some old bits of land, some worn out meadow or pasture that, being ploughed up and got into shape, would bring a fair crop of Hungarian gras, or late sown tares and rape. Anything is better than letting such a piece lie idle. or growing nothing but weeds. Turn it over; put the grobber aer as it once or twice; harrow till fine, and then sow 28 lbs. of Hungarian grass, or two bushels of tares and 3 lbs. of rape to and even if they are on grass, it will the arpent; and in the former case you pay to make a small eaclosure, in a will have a fair cut of grass for hay in August, in the latter a splendld lot of a triffe of grain to eat, given in troughs, feed for your sheep, that may be gone Here again, pease are the test food for over two or three times before the frost cuts it up. The horses will have to be fed pretty well while doing this work, and will come all the . Her to the still more arduous labour of drawing the mower at hay-time, and the reaper at harvest-time, than if they had passed the month of June in idleness. or vetches do better, far better, on heavy then on light land, and we never could understand why our heavy land men sow them so seldom.

COMMON-SENSE FARMING.

The farmer's privileges, difficulties, duties, and responsabilities.

After all, no theory is a correct one that will not bear the light of common sense. Let us then study these questions for a short time from a common sense stand-point.

First, what advantages do the life of a farmer present? He belongs to the most honorable and important class of the world's workers, for upon his success depends the prosperity of all others; he is a direct co-operator with the Creator, who has provided all the herbs and fruits necessary for the sustenance of mankind and given him the intelligence required to enable him to improve and increase them by cultivation, thus he may be said, under Providence, to be a wealth "producer." not merely a manipulator, as the artizan and manufacturer, or accumulator as the banker or merchant, but one who assists in the production of the raw materials wherewith the workman makes the food, clothes, tools, or dwellings into serviceable form, the merchant being the channel by which , they are dispensed, and the financier, he who atterds to the monetary part improvements in the management of of the social system; all useful in their places, but the farmer first. Paul may flocks has been terribly neglected. Oh! plant and Apollos may water, but God giveth the increase, notwithstanding which there must be Pauls and Apolloses Another advantage that the farmer enjoys is that his employment is a wholesome one, not confined to the smoky work shop or foundry, the dusty mill, the badly ventilated city office, or gloomy mine, but where he can breathe the pure, free air of heaven, listen to the music of the birds, or to the distant sound of the waterfall. and enjoy the beauty and fragrance of the flowers and verdure by which he

All this may seem romantic and ab-

tented with their lot and therefore nothing to learn, and are content society.

Again, the farmer is a privileged domestic; he, unlike the commercial traveller, the sailor, or the railroad business in the bosom of his family who, if well trained, will, while growing up, render him great assistance.

In Canada, too, being part of the possessions of Great Britain, he is under the flag of a nation who, whatever may be said to the contrary, protects the rights of her people, and whose polley is to legislate for the good of all. Socially, too, he has nothing to complain of. Religion is free, and all denominations can worship God as their church or conscience dictates. Education is fostered, and its system is being gradually improved, and never was a time when so much attention has been paid to the means by which the condition of the Agriculturist can be improved and encouragements held out to him to exercise his talents and abilities so as to insure success. Some time ago, a High Commission was sent from the home Government to report upon the condition of affairs in Canada as a place to emigrate to, and its report should be full of encouragement to those who are already settled here. Here are some of the opinious of men well qualified to judge. Mr. Joseph Smith says:

"The numerous advantages to settlers in Canada are: "firstly, it is a part of the British Empire, and under British laws and regulations: secondly many of the people are our own relations; thirdly, it means the building up of one great Empire; fourthly, Canada has a great future before it, and with its stalwart sons has a great part to play in the said Empire; fifthly, it is a place where little is thought of wealth and more of men and character; sixthly, a man can get on there with less capital, and make a better living for himself and family than elsewhere' --Mr. T. Pitt: "Were I emigrating to any part of Great Britain there is none I should prefer to Canada, where you can live on half the income with similar surroundings, "-Mr. A. J. Davies: "To the great army of farmers sons I believe that Canada offers, as a field for settlement, the best advantages"-Mr. N. H. Dempster still more emphaticaly remarks: " We are unanimous in the opinion that Canada is a great but undeveloped country with unbounded wealth both in mines and agriculture. Many thousand of families who are striving against the tide of fortune in great Britain will obtain, in Canada, what they never can expect where they are, namely, the privilege of being their own landlords with the law and liberty of the mother country.'

Difficulties. To say dian farming is not attended with some difficulties, would not be true; for instance, the winters are long and would iax the severe, patience of those who had not been used to them. Snow is not altogether an upprofitable crop, and, if we did not have it in abundance, profitable farming would be impossible. We experience, as every where else. difficulty from keen competition and consequent low prices for most agricultural products.

But the worst difficulties too many own making: carelessness: inattention to business; an idea that they have other methods of proposed amelioration

better farmers and better members of 10 keep in the old rut; not studying the details of various necessary operations and methods; loss person, inasmuch as his occupation is of time and opportunity; want of a well formulated system of management; having no definite and well ditrain employé, etc, can carry on his gested plan of action; neglect to keep accounts or any record of transactions as a reference to the past or as a guide to the future. Often a man's worst enemy is himself, and more potent for evil results is his own conduct than all the adverse climatic influences, close competition, noxious weeds, destructive insects or blighting mildews, If we conquer the bad within us, we shall find it much easier to battle with the evils which beset us from without.

In face of the difficulties above alluded to, it appears that the farmer's duties are plain, namely, in the first place, to cultivate his brains by study and observation; to adopt such methods of culture and care of stock as the conditions which surround him seem to demand, always remembering that the shortness of summer makes to "take time by the forelock." the more obligatory; to practise the most rigid economy as to the husbanding of all the natural resources of the farm, so as to let nothing be wasted, and thus to produce everything at the lowest cost grow all he can to feed his stock with; not purchase for each anything he can grow; thus he will be able to defy competition, and if, by strict attention to the conservation of the natural fertilizers made in due course, and by applying them properly, he can double his crops, it will be at once apparent that he can affort to sell at a lower price than if his land only produced poorly, and his cattle only yielded a flow of milk half the year.

Common sense will teach us that, hi the natural course of this world, every occupation which has certain advantahas also difficulties to contend ges with and duties to perform, and the greater the advantages the greater the duties and responsibilities.

In the first place the farmer, as indeed are all men, is responsible to the great Giver of all good for all that he enjoys and will be rewarded or punished according to the use he makes of it If he has a family, which, as I have stated above, seeing that his occupation is a domestic one, he should behave he is responsible for their proper bringing up, and not only their happiness but his own, and may hap that of the partner of his declining years, any dependent upon how well this has been accomplished. The farmer is also responsible to the community in which he lives: goes before precept, and it is very no ticeable that in places where there are good practical energetic men,that many are following their lead so that every man who benefits himself by good conduct is a public benefactor at the same time. In rural localities where each family are more or less acquainted. these examples are more forcefull than in cities.

Lastly, the farmer is responsible to the whole country in which his lot is cast and to those whom he has helped to place in a position to legislate, to strengthen their hands in all legitimate means they may adopt to instruct and assist him. The efforts made to popularice agricultural education, to make exportation of products successful and farmers suffer from are those of their placed on the great markets of the world in their normal state, and all

will be useless unless the farmer keeps his share of the matter in view and accepts the offers of assistance, proving this by practical results.

GEO. MOORE.

THE FROST.

M. Bouth'llier's clovers, and which is tar worse, all his lucerne, are entirely destroyed by the thawing and freezing of the past winter. So valuable, however has he found the lucerne-crop, that he has sown down another piece of it, an acre and a half in extent, besides following it up on the old field. We advised him to sow a couple of bushels of land plaster on the young plants, which are up already, as, on his sandy land, the sulphate of lime must one would think, be beneficial.

WASTE OF SILAGE.

A propos of John Gould's complaint, that he has this year an unusual wast. of silage, following if not caused by "tramping," is this item in the last report of the Minnesota Dairymen's Association. In the discussion following his paper on The Silo on the Dairy Farm Mr. H. C. Carpenter, being inquired of as to his method of filling a two-pit silo said:

"We simply throw the corn in and it drops on each side. Another point. I lost considerable round the walls, and believe it was the result of too much tramping. The idea is that we tramp it through the centre, cross-ways and along the side and everywhere, and the result was that when it settled, the outside did not settle as much as practice has been long followed, the the centre, and down went the air right results were formerly all that could be along my wall. It is a big item. We desired. But of late years there have now simply tramp around the wall and let the center take care of itself. When it settles, it simply presses out."

" Hoard ".

TO GET A STAND OF CLOVER.

Hello there! you man hurrying along so fast and grumbling to yourself! Stop a minute and take heed to what "Hoard's Dairyman" has to say to you! You say you can't, because you are in such a hurry? That's what's the matter with you. You are always in such a hurry and work so hard that you don't take any time to think and consequently you work to no purpose.

We want to tell you how you can have some clover and things to feed your cows when there isn't feed enough for thom in the pasture. You say you "can't get no catch of clover." We say you can, and if you will only stop your everiastyou how to do it.

onts, two bushels to the acre, and five put it there. All over the central part or six quarts of clover seed. Roll the ground down after seeding and then do not get the results we did from harrow with a light, fine tooth harrow. plaster, which was formerly about all Soon after the oats are headed and hefore any grain has formed, cut the oats that, instead of being a manure, the for hay. They make excellent hay cut at that stage; or they can be used if man, was simply a means for renderneeded for a soiling crop. Taking off the oats will give the clover a chance the clover suffers for need of plant and you will be almost sure to get a good stand. You don't believe it, eh? We can ished soil to yield up more after the prove it to you. Don't you remember deposit is about gone. three years ago, the last time you tried

dry year and nearly every one lost their clover seeding, it died either just before harvest or just after? Well, you know we were at your place in the fall. You know you tried to seed with oats that year. On the little patch near the barn where you cut the oats green for your horses, there was fine clover, all in blossom, and on the rest of the field, where you let the oats ripen, there was not a single clover plant.

The truth is it takes lots of water eut of the ground to mature a crop of oats. They say out at the Wisconsin Experiment Station, that it took 512 pounds of water for every pound of dry matter in the oat crop. A large proportion of that water was used to produce the grain. You can see why the clover dried up. It is because the oats stole the water all away from it.

If you had not been in such an awful hurry all the time, and had only taken time to think, you might have taken in that fact and profited by it. That's the way a neighbor of ours found it out that same year, and he has profited by it every year since by having a splendid stand of clover and having nice oat

Out hay is splendid if it is cut earlybefore any grain is formed.

" Hoard."

WHAT SHALL WE DO FOR THE YOUNG CLOVER THIS SPRING.

For generation, farmers have been taught that the best thing to do for young clover the second spring to encourage its growth and to give a good crop of hay is to apply a dressing of plaster. In many sections, where this results were formerly all that could be come complaints that plaster no longer has the effect it once had, and farmers want to know the reason. We have no doubt that in many sections one reason for this condition is the exhaustion of the supply of potash in the soil. Men have long wondered why the action of plaster is so uncertain, and that while it has a wonderful effect on some soils, it should have none at all on others.

So long as a soll is rich in potash. plaster will have a good effect in making the otherwise insoluble potash in the soil available for crops. But in many places the supply of potash silicates is far from being inexhaustible, and there men have found that through its stimulating effect they have been enabled to rob the land of potash, and when they as usual apply the plaster to the young clover it no longer produces the effect it once had, and the only apparent effect is what can be attributed to the lime given as plant ing hurry a few minutes, we will tell food direct, which is small indeed. Now having, by means of the reagent, been As soon as the ground is in condition enabled to use up the potash in the to work, fit a piece nicely and sow it to soil, the only way to get it back is to of New York men write to me : the manure we used." The fact was plaster, in the hands of a thoughtless mg his land unproductive. Now when food, you try to induce the impover-

What the clover needs is phosphoric to seed to clover and it was a very acid and potash, and you cannot get either of these from the air as you can application of superphosphate and potash on the young clover this spring phosphoric acid can be had is in the dissolved phosphate rock, and the best form of potash for general purposes is perhaps the muriate. For clover we would make a ton of this by mixing 1600 lbs. of the acid phosphate to 400 lbs. of the muriate of potash, and would apply to the clover about 400 lbs. per acre. You will get, in the acid as it is much needed. phosphate, about 40 p. c. of plaster, so you will be giving some plaster in any event. I will warrant that the application will give a horvier growth of the clover, and while the application aright not return a profit in the licreased amount of hay, it will show up bravely in the corn grop that should follow on the clover sod the next year. I have never been able to make an anplication of commercial fertilizer pay on the corn crop direct, but the application of anneral fertilizers on the clover the year before has always paid me, in the clover and corn crop together, and through the increased growth of the clover and the permanent improvement of the soil.

W. F. Massey.

To the Editor of the Journal of Agriculture.

There is not much to write about the state of the crops at present. The season, or properly speaking seeding, is much later than last year, although I feel certain that vegetation is as far, if not a trifle more, advanced than at this date last year. In 1896 the greater portion of the seeding was done in April, while this year very little has been completed. The first few days of May are backward also, it rains a little every day-not much but enough to stop seeding-while grass is looking well. trees are coming on nicely. In a good many sections grass has been severely killed by the frost : (winter killed). I hope the farmers will see to it and provide something for the cattle to eat during the short pastures. Peas and oats sown together, or better still oats and vetches make the earliest kind of green fodder-sow a piece early, then say in 10 days another patch and then about 10 days more a third piece-so that by the end of June the first piece would be ready to cut and by the time the first plot is done the second should be ready, and so on; and if the piece of ground is rich and the season not to dry, you will be able to cut it at least twice-any farmer can at least try it, and you will be surprised at the results.

Do not forget to sow some corn for green fodder later on-the last half of August or September,-by so doing the cows are kept up in the flow of milk: there is no kind of farring pays as well as dairving:

By the way, a great many, in apply ing manure to fruit trees, recommend putting it close round the trunks. while others advise putting it bank a little. No doubt many can show very good reasons why so applied; but one of my neighbors has a new method of applying the manure: by putting it upon the branches. I have not had a chance, so far, of finding out the reasons for so doing, but each day the fact stares me in the face.

the nitrogen. Suppose then you try an Sth May. It is two years ago be washed away like a bunch of feasince so much damage was done by frost, especially in Outario and and note the results. The most gen-the south west of Quebec. I harderally available form in which the ly think the fruit trees were far enough advanced to harm them any for this season. Seeding is exceedingly late: this is the 10th May and hardly any sowing or seeding done yet-certainly we are at least three weeks behind last year ;-usually, early sown grain does better than late, it is to be hoped fine weather will set in at once

> Yours truly. PETER MACFARLANE. Chatcauguay, 10th May 1897.

RECLAMATION OF BOGS AND SWAMPS.

Cattle vs. snipe - Walls - Ditches and banks - Drains - Pumps -Change of herbage - Needs for -Stocking - Rushes for ornaments.

It is so pleasant to the tread, so pleasing to the eye, to walk over a swamp on a fine June morning, that any attempt to convert it into a plain, even a pasture marsh would seem vandalism to the mere lover of simple nature. By so doing, the ever-rustling sedges and rushes would be taken away, the waving cotton plants and all those tender blossoms found in such places, would be obliterated from the landscape.

These considerations were not taken into account in years gone by, when owners of swamps were able, with the assistance of capital, to carry their ideas into practice, and the "scaping" of snipe had perforce to give place, to the lowing of cattle.

In these days of what is called agricultural depression, we find many instances where this order of things is reversed, and instead of swamps becoming marshes, many marshes are becoming swamps, because the pockets of their owners have been so bled by the times, that they are powerless to help themselves.

It is an old English quotation that "hope springs eternal in the human breast, "and, though nany of us may not have the necessary funds at our dis posal to carry out our ideas at the p esent moment, that happy day may not be as far distant as we imagine, and looking at the bright side of things only, we will consider what could be done in the way of improving I w lying marshes, swamps and logs. The difficulties to be surmounted in a matter of this kind are, as a rule, considerable. The first step is a careful survey of the land proposed to be dealt with.

Having surveyed, the man is marked where it is considered practicable to make walls, and the land to cut dykes or drainage ditches. In building walls it may be necessary to pile, or cut a ditch. and "puddle in" with tenacious sois, as few walls are of effectual service, unless a foundation of some kind is found, or artificially constructed. In some cases it is advisable to avoid cer tain spots, or to make a detour, where the land that would be enclosed, would probably not be worth the cost of inclosing. If the wall is made without touching a solid subseil, the work may prove to be labour in vain, where water is the boundary line, for when a storm Mr. Editor, since commencing this arises, and a heavy pressure is brought we have had two nights to bear upon the wall on a lee shore,

thers. Where retentive soil cannot be found, on which to place a foundation, an artificial one must be constructed, and a rib of good holding matter, such as chalk or elay, puddled into the centre of the wall; a row of willows is a good addition if planted near the edges of the wall.

A ditch is almost invariably cut either on the inside or on the outside of the wall, which in building operations, not only assists as a roadway, but also helps to build the wall, the soil extracted being used for that purpose,

It is impossible to give but the most general outline of the subject matter, because each case must necessarily depend upon its own individual circumstances.

Having completed the walls and banks satisfactorily, the next top is to cut dykes and drains, gradually en'arging them the nearer they approach their main outlet.

The vast improvements that have been made in the last few years in pumps and turbines for dramage purposes have greatly facilitated the reclamation of swampy land, and suitable machinery can be obtained for draining nearly any land at a minimum of cost, to what was the case a few years ago. In 'electing a numb err rather on the side of getting one larger than is required, than smaller: The extra cutlay will never be regretted. It is hardly necessary to add, that the drains and dykes must always be kept well cleared of all we ds and water growth, so that the water has easy flow, which is the key-note of success in drainage.

The first effect noticeable in swamp reclamation, is that the natural bog vegetation, becomes thinner, and more stunted in growth, moss begins to appear in large quantities, and a reculiar grass (somewhat resembling couchputs in an appearance. About grass June 15 mow down as closely as possible all vegetation, which bloods, weakens, and destroys water loving plants. In a short time nothing will be seen upon the marsh except a few straggling black rushes, and the aforesaid moss and blue grass, which nothing will eat. By diligently moulding and sowing renevating seeds, some useful grasses will soon establish themselves.

In the selection of renovating seeds, the nature of the soil used for moulding, must not be forgotten, also the general nature and surroundings of the land proposed to be sown, and make allowances accordingly.

Observe those seeds which thrive best and profit by experiments.

Of the heavy seeds most benefit may be derived from red sucking, white clover and perennial cow grass, (t. prateuse perenne). In grasses the coarser are preferable to the finer : cocksfoot is better than either of the hard tall, or meadow fescues. Of the poas. Poa aquatica-if it can be obtained-is the most serviceable.

At this stage the marsh, -if it can be called a marsh,-cannot be punished too much, by stock feeding or jamming about on it.-In the spring if practicable, fold sheep on the marsh, and the transformation will be more rapid and lasting. Treatment such as this, forms a kind of crust, which seems to give the better grass good root hold, and in moulding any son will do, though naturally the richer and heavier it is, the better.

is under consideration, it should be re- grasses, must be left to flourish in their

of pretty severe frost, the 7th and the whole wall may in places lift, and membered that, unless the improvements are thoroughly and efficiently carried out, they had better be left alone, as it is a fatal mistake to destroy a quantity of good litter, in order to secure a miserable has crop, or perhaps no hay at all.

> The great advantage to be looked for by the reclaimer, is the feed he hopes to obtain, because, although reclaimed bogs will not produce inordinately in a wet and cold summer, when hay and feed is so plentiful, and store cattle are so dear it does not pay to buy them; yet during a hot, dry season, when both hay and fodder are scarce, these reclaimed swamps, favoured by the sun's rays, produce feed of an abnormally fine quality, and in quantity an amount that is truly astonishing.

The first sign of improvement in reclaiming bogs and swamps, will be the disappearance of the black rush. and the appearance of the hissock rush. Botanists assert that hissock rushes profer spongy bogs to better drained marshes, but with all due respect, this may be doubted, because although their presence is common enough on the edges and drier parts of spongy bogs, experience teaches that these rushes require land which is good, which has been partially drained, and upon which the ordinary bog rush does not thrive so well. This opinion is confirmed by the fact that, as soon as the bogs are improved and the drainage is got on with, the hissock rush appears.

A similar experience will be met with, when a moist pasture has been neglected, and its drains allowed to grow up. The hissock grass, therefore, becomes, if it may be so expressed, both the harbinger of good and evil. It is welcome on the lamis being reclaimed, but its re-appearance is regretted on the lands that have been reclaimed, which, by reason of negligence or want of means, have been neglected. For the removal of hissock grass, the mattock must be freely handled; its presence denotes insufficient drainage and a surplus of water. To those who are inexperienced, sed ges, rushes, and water grasses are thought useless, except for litter, but such is far from the fact.

The giant bulrush is largely used in England in the manufacture of horse collars, especially those employed in breaking colts and horses with tender shoulders. Coopers use them for barrel making, and of late years they have been in great demand by furniture manmacturers.

The harvesting of bulrushes might at first sight seem simple and easy : it is not so. To obtain a good article, which will find a market, rushes must be most skilfully and deftly manipulated when first cut, say end of June, for ornamental work, otherwise they lose their beautiful glaucous colour, which is their most necessary essential. For decorative purposes in ladies' boudoirs. halls or rooms, they are gathered in September, and should be set in water for a few days, in order to develop their heads of light cotton wool like bloom, which they will retain for months if not exposed to the wind.

The roots of many of these water plants are edible : they contain much nutriment and chemical compounds. and are much esteemed by some, more especially so by the inhabitants of iceland.

But this is a digression, too far from the real subject matter of the heading. When the reglamation of swampy land so the rushes, sedges, and water own particular habitat, whether the the last 30 acres, or thereabouts, of water be moving or stagnant, deep or fleet, clear or thick, brackish or sult.

W. R. GILBERT.

HAY.

Ah! It is only ringing the changes on the old peal of bells, this writing on the same renewed subject with the return of every spring; but, who knows? a few words, dropped here and there, may meet the eye of some one to whom they may be now, and at least awaken thought in a brain that has receptivity enough to seize hold of them, and, by dint of turning them over and over, end by seing some ray of light that had not previously struck his vision.

May we say, without offence, that most farmers let their clovers stand too long before cutting them for hay. In general, clover is fit to cut, is ready to cut, and ought to be cut, by the last week in June. We are speaking of the Montreal district, of course; for, in the neighborhood of Quebec, it is doubtless a week or ten days later.

As we have remarked in this perio dical times out of number, half the value of clover is lost by its being too advanced before it is cut.

Of course, early cut clover takes longer to make than if it is allowed to stand until nearly ripe before mowing but that is of no consequence compared with the fact that, in one case the leaves adhere, in all their freshness, to the stalk, and, in the other nothing is lett, when the hay is made but the head and the bare stalk. In England, as we have often mentioned clover always brings from \$5.00 to \$6.00 a ton more than any other kind of hay, and the reason is that it is cut green and cured in the cock.

Clover, cut early, turned over gently, once or twice as may seem necessary got lato cock when neither rain nor the afternoon's dew is hanging about it made safe, if you please, by hay-caps, and carried to the barn, or preferably to the stack, when thoroughly fit, is the most valuable of all hay.

We often read, in the agricultural pa pers of the States, about cutting hay in the morning, and putting it into the barn after dinner. This appears to be a common practice; the "hay" is cut for it was hay, i. e., dried herbage before cutting; but you cannot cut "grass" in the morning and carry it iu the afternoon; grass, or clover, cut on Monday morning, in really proper condition, cannot be fit to carry before, at the very earliest, Wednesday noon.

Another reason for beginning to cut your clover early is this: if you have as many Eastern Townships' farmers have, 50 or 60 acres of hay to make, and you do not begin having till the blossom of the clover is brown, and the timothy is shedding its first bloom, be cause grass in that condition is oasier to make into hay; and if, after the first two or three days, the weather becomes unfavorable, and a stop is put to the work by continuous rain; consider. please, what kind of a state the last ten or twelve acres will be in by the time the mower reaches them!

We remember well the hay-reason of 1872, at Compton. Col. Pomroy and Mr. Quartus Bliss had, each, from 100 to 120 acres of hay to make. They did not begin till a fortnight after the meadows were, to our eye, quite fit; rain interrupted the work very soon of uble ingredients." That is, of convert-

each farm were utterly workless, the standing grass crumbling to pleces when rubbed betwen the fingers: fair oatstraw would have been far more nu-

Of course, any one can see that, if the clover is cut early, the second cut has a much better chance to come away than when the first crop is left till later. And this is of great importance; for, If the second-crop is not ready for the mower before the middle of September, there is generally so much moisturerain, dew, and fog-at that season, that second out clover-hay is rarely well made. As we have said before in this periodical, the silo is the best place

When clover-hay is once in cock, never break it out again unless it is absolutely necessary, which can only be in the case of prolonged rain. If you look round the spot where the cocks that have been broken out stood, the quantity of leaves left there will tell you why the practice is wrong.

SUMMER FALLOWS. - Without being a very great "praiser of the times and practices of ancient days," we cannot help having a lingering affection for the regular summer fallow on heavy soils, particularly now that there are so many most effective implements available for the tormenting of the We remember that in the "thirties", almost all the heavy soils in the S. E. of England were summerfallowed once every fifth or sixth year; the finest Chevaller barley grown in England was produced in Essex, Hertfordshire, etc., after a long fallow, on land so heavy that it was impossible to grow roots on it for sheep-folding; and ex ept a field of tares for the horses, and a few acres of mangels, no other use of the land was made after the grain-crop that followed the clover, so that the land lay at least 18 months unoccupied. The average yield of very moderately good clays, after the fallow, was 60 bushels of the finest malting barley, which, as the price was at least 40s a quarter in those days, was supposed to pay the tenant, the rent of the land being, as a rule, not more than a pound an acre, and the wages of the farm-labourer, shame fully low, not more, certainly, than eight shillings a week, If so much.

The fallow was made thus: After wheat, the land was broad-shared (stubble cleaned), the couch and other rubbish cleared off and burnt, and the land laid up with a deep furrow for the winter. In spring, the furrows of the fall ploughing were, to use the current phrase, "hunted back," and well grubbed and harrowed, previous to Then, more being cross-ploughed. grubber and harrow-work followed, until July, when, perhaps, on the lighter clays, a lot of it might be sown to rape for the sheep, and; when that had been fed-off, a fair dressing of dung having been applied for it, the land was shallow-ploughed, and left till barley seed-time. Then followed grassseeds and then wheat, which sometimes was succeeded by oats, but, more generally, by the fallow again.

And what is the benefit derived from the fallow, besides the destruction of weeds? This: the "Fallow, in its most extended sense, means that period of culture during which a soil is exposed to the action of the weather for the purpose of enriching it in certain sol-

soluble ones. "In a more confined to the best method of dealing with poor seuse, the time of fallow may be limited to the intervals in the cultivation of the cereals; for a magazine of soluble sillicates and alkalies, is an essential condition to the existence of such plants." (Baron von Lieblg).

Well, without recommending such a constant repetition of this process as is pursued on English clays, we do think that, in districts where the land has run out, become full of couch and other weeds, and when the farm is too far from our large towns to be able to draw manure, that a moderate acreage of land treated in this way, would prove very beneficial to the far-

A NEGLECTED MEADOW.-On my farm are several acres which for years yielded a good crop of hay, but for some time past the place has been worked by a person who had no interest in it, no fertilizer has been used, and the grass has become thin and mossy. Is there anything that could be used to restore growth without plowing? It is on high ground, well drained, somewhat stony. Any information through your paper will be thankfully received. W. C. D. "Troy, N. Y." (You had better sow one quart of medium red clover. one quart of alsike and two quarts of timothy per acre. Then thoroughly scarify with a harrow which has numerous small, sharp teeth, and roll thoroughly. At the time of sowing the grass seed, apply 100 to 200 pounds of fertilizer, composed of equal parts of muriate of potash and nitrate of soda. Send us four ounces of your soil, and we will test it for addity. It is possible that this meadow would be greatly improved by an application of lime. I: so, such aplication might be made next fell. Of course, this reseeding will not have its full effect until another year. Kindly report results.)

"Country Gentleman."

CROPPING POOR LAND.

What to do ourselves is much more difficult than advising other people. Here is a case-a poor field bearing a wretched covering of seeds, mown last summer, and yielding a miserable crop of weedy hay. What is to be done with it? To let it lie is simple, but is tantamount to letting it out of cultivation. What is the best thing to do with such a field? If anyone were asked, he might not find it difficult to recommend a course not free from objection and probably entailing heavy expense. To plough it up and take a crop of onts would seem practical, were it not for the extreme probability of partial tailure. To break it up for roots next spring is also practicable, and, on the whole, more likely to succeed and bring it round, but the expense would he great, and the return long deferred. Perhaps the best course to pursue would be to take outs and top-dress them with nitrate of soda in March. but this would probably tell upon the land injuriously the succeeding year. Land is certainly more readily cleaned after a corn stubble than out of seeds, and on the whole it would seem better to risk grain, asisted with a top-dressing, than to attempt roots, especially if the latter course would give a larger area of root land than is usual on the farm. This, then, is the plan which we recommend, and which we really think

worn out land. And we are more often consulted on such cases than on the more honeful treatment of good land. The costs of cultivation remain much the same whether good or bad, and it is unfortunately too easy to see that 30 bushels of outs at 30 cts. a bushel leaves a distinct loss to the cultivator. A dressing of \$3.00 worth of nitrate might readily give an increase of 10 bushels of grain as well as a larger weight of straw, and on no land will a top-dressing tell so surely as upon this same poor stuff scarcely worth ploughing up. It would also be well that the field should be ploughed without delay, in order that the oats may be sown either late in April or early in May, and with the help of a good season and a topdressing we might be agreeably surprised with the crop. We throw out these hints for the benefit of a large class of correspondents who almost weekly inquire what is to be done with poor old seeds, neither at to live or die, but which must be done something with. They lie upon the high-lying downs, which at one time yielded a scant but sweet herbage for sheep, but were unhappily broken up in times of temptation, and their occupiers, having yielded in a moment of weakness, are now at their wits' end to know how to keep them going as tillage land. The secret of success seems to rest in 60 cents an acre rent and farming at the least possible outlay. Such lands may, however, be brought round after the oat erop above recommended has been harvested, for then comes the renovating root crop, and the sheep following assisted by a moderate allowance of cake. Root cultivation and ilberal sheep-farming is the salvation of such poor, thin lands, and, if persevered in, they may grow remunerative crops if well managed.

AUSTRALIAN PRIZES FOR FARM PRODUCTS.

In Australia, they are going to offer, at an Exposition, valuable prizes for exportable produce among which we find the following:

BUTTER FOR EXPORT

Prize, £50-Best exhibit of five boxes butter, suitable for export,

1.-Each exhibit shall consist of five boxes butter, each of 56 lbs, net weight. 2.-No exhibitor shall connete with more than one exhibit.

30.—The boxes must be of the latest type of export box, hollowed out to allow circulation of air.

40.- All exhibits competing in this section must be stored in the Government Refrigerating depot at least six weeks prior to date of Show.

POULTRY FOR EXPORT

First prize, £10; second, £5-Best exsibit of two cases each, Ducks and Fowls, suitable for export (twenty oirds in each case), packed for export. The birds must be killed, dressed, wropped, and packed, and must be stored in the Government Refrigerating depot at least six weeks prior to date of Show.

WHEAT FOR EXPORT.

First prize, £15; second, £10,-Best exhibit of wheat, four bushel sack, representing a bulk of not less than 100 sacks suitable for export. Grower to we should ourselves follow. Of all sell 100 sacks equal to exhibit by public ter it was started; a wet time followed; ing certain insoluble ingredients into things it is most difficult to advise as auction during show, if called on to through the secretary, and, failing to supply such quantity of equal sample. to forfeit any prize which may have been awarded.

The same conditions for burley for export.

Notes by the Way.

NOTES.

We regret very much not having given Mr. Waugh, Editor of the "Nor-West Farmer," credit for the very excellent article, on "Scientific Agriculture," that appeared in our May number

JUBILEE LECTURE AT BERGER-VILLE.

The "Clite" of Bergerville assembled in the Mountain School Hall last night to listen to a lecture given by Mr. George Moore on "Woman's Influence on Horticulture and Its Effects Upon Society in General," The lecturer dwell upon the good example set by our be loved Queen in this respect, and the good accrumg from the knowledge and love of horticulture morally, socially, physically and commercially, Mr. Moore has always afforded us great pleasure in listening to him, but on this occasion he exceeded all his former efforts. The chair was taken by Sir James LeMoine, who, with a few enlogistic romarks, introduced the lecturer as an qld friend. At the close of the lecture, which was listened to with wrapt attention and frequently applauded, a vote of thanks was proposed by the Rev. Father Audette, and seconded by Colonel J. Bell Forsyth. The proceedings concluded with the National Anthem.

" Morning Chronicle."

The Dairy.

DAIRYING AND BACON.

Butter-Cheese-Danish vs. Canadian butter-Refrigeration-Ontariovs Quebec cheese - Yorkshire and Tamworth hogs.

Quebec, April 17th 1897.

Interviews of Mr. Walter Stark, of MM. Carter, Wilkinson & Co., Liverpool, with the Assistant-Commissioner of Agriculture.

Defects in our butter.-Regular shipments and their effects.- Canadian butter compared to Danish butter. Danish butter sold fresh. Prospect o the butter trade, improvement of Quebec cheese, Packing, -Curing of cheese.-Difference between the Ontario and Quebec cheese. - Colored cheese.-Price of the Ontario cheese in England.-Consumption of cheese in England.-Bacon.-Pigs should be thin any young.-The demand greater than the supply.

What are the defects in our butter ? M. STARK.-Speaking generally your butter comes forward, when shipped: direct from the factory, very superlor and in much better condition than when

do so by written notice delivered this matter with you. Factory men in your province who ship their butter regularly and promptly, have, I belteve netted their patrons very satisfactory prices on the average, throughout the past season, I have found occasional shipments more or less mildewed in consequence of the want of sufficient care and ability in the manufacture, or in some instances, I believe. arising from the butter being held in a damp place or exposed to damp atmosphere in transit. Next to the importance of proper manufacture, packing is certainly deserving much more attention than it has yet received. I saw some boxes of butter from Quebec last year with salt outside the parchment paper similar to the way in which it used to be placed in tubs when the butter was intented to be carried for four or six

ning first place for their products, and average.

How long can butter remain in revalue or quality?

Given proper refrigeration, either the rect expansion at a temperature of 180 Irish creamery in the same package. to 200 I believe fine butter can be safely kept for many months if necessary. As a matter of fact I have sold creamery butter in England for American Shippers at fairly good prices in time of searcity and have afterwards heard that it was many months old. This however does not after my conviction already expressed, that high

WINTERHALFER'S PORTRAIT OF HER MAJESTY - 1846

months. This is a quite a mistake on the part of your factorymen. They should use the thickest parchment pa per they can get, and see to it that the boxes are the same size and net weight, and what is still of even more importance that the wood has been very carefully seasoned before the butter is placed into the boxes. Although so much has been said about this Important point, it is a strange fact that we even now get butter of very choice quality, boxes shipped to my care. sent forward to Britain packed in boxes made from quite green wood, consequently the butter has what our English friends call the "Canadian woody flavor."

Should it be shipped every week?

grade butter, which is certainly the most profitable to make, should be sold and consumed as quickly as possible

Have regular shipments helped in improving our Butter trade ?

Very much so. Last season I had many customers who were waiting the arrival of the Canadian steamers for regular delivery of some good brands of the best Canadian Creamery in

How does our Butter compare with Danish Butter?

Speaking generally there is a lack of freshness, or what is commonly termed by some dealers a rosiness in your butter in comparison with Daulsh. The There is no doubt those factorymen | Dane make their butter for quick sale,

ward and being placed before the con-therefore cater for the highest class sumer regularly and quickly, are win consumers. As you can readily understand, they can quickly market their what is still more important to the goods in England, and therefore have patrons, netting better prices on the an advantage over the Canadian producer. It will no doubt be gratifying to you to know that outside Danish, the frigeration without losing any of its cholcest of Canadian Creamery in boxes compares favorably for the next class trade, very often realizing almost. cold air circulation, brine pipes, or did if not quite as much, as fresh made

Is Danish butter kept in refrigerators or sold immediately after it is made? I believe a few merchants in England place a large line of Danish creamery butter into the refrigerators, when the market is very low, purely as a speculation, but speaking generally the Danish butter is not carried or kept in refrigerators. I have often wondered why not, especially as the Manchester mar ket where a very large proportion of the trade is done weekly, is sometimes converted into a very serious slaughter market in consequence of the butter being so mild and the demand insufficient for the supply.

Is Canadian butter kept in refrigerators in England?

Yes. We have at last arrived at the conclusion that refrigeration is desirable even in England. My firm have first class facilities for protecting the high grade butter shipped to our care both in Laverpool, London and Bristol. We find as a rule that should our buyers wish to leave the butter in our bands even for a week or two, they now insist upon its being stored at a low temperature until they require it on the counter for consumption.

What is the prospect for the butter trade 2

In my judgement provided the Causdraw producer will continue his efforts to in prove the character of his butter. you may yet very considerably increase your trade with Britain, As you no doubt are aware Canada is even now only securing a very small percentage of the trade. The consumption of butter in England continues, probably increases, from year to year, and remarkable as it may seem to you, it is a fact nevertheless that our English firmers are not developing this business with the increased demand. A few enterprising landlords and gentlemen of position have put in separators and encouraged the manufacture of really high grade creamery, but a very large proportion of the English butter is still made by the farmers' wives as of old, hence the business is steadily passing from them. As you no doubt are aware the Australian colonies are still progressing and in my judgment it is wise for all the Canadian fine butter to be sold just about as fast as it is made. I am pleased to say the time is very near at hand when the speculator this side will be unable to make much profit by carrying summer butter into the fall.

How does Quebec cheese compare with those you received from our province last season?

Speaking generally I think there is some improvement, but unfortunately early in the season we had quite a sprinkling of garlic flavored cheese, we believe, arising from bad rennet, however this matter has now been so thoroughly discussed in the press. I presume very little good will come of my saying more about it.

What about the packing of our cheese ?

You will no doubt remember when I last had the pleasure of an interview I last had the pleasure of discussing who insist upon their butter going for- putting in only about 3 p. c. of sait and with you, I was complaining of the

poor boxes used in your province. I the choicer Canadian meat. What we a gallon of water for each vat of milk; am pleased to say there has been a need is light hogs ranging from 75 to Stir thoroughly for 4 or 5 minutes after little improvement, but the best box that I have yet seen in Quebec is that made by Mr. Bolvin, of Ohlcontime. These are made of white birch and certainly are a much cleaner, firmer box than those we usually receive from the district.

Is cheese shipped too green?

This depends entirely upon the factory in which made and the weather. Speaking generally, a question that has to be decided on the spot from time to time. When buying this side we understand the goods would be made within, at the most, 28 days of date of shipment. Many of your factories are too frail to protect the goods well in hot weather. No doubt those factories that have the capital and courage to cool their factories with the are the best off in this respect, prevention being better than cure, under any circonstances, but unfortunately if the boys get their cheese or butter heated. there is no cure.

Is there a great deal of difference as to quality between the Ontario and Quebec cheese ?

Yes, especially colored, from the standpoint of uniformity in quality, and make, and general keeping properties, in favor of the Ontario cheese, but your manufacturers are certainly making satisfactory progress, and in white cheese they usually send us such goods as please our customers. In my judgement they would be wise to continue in well doing, leaving the older factories in Ontario and other provinces to make colored cheese.

Do the English Cheese dealers sell the Ontario Cheese at a higher price than the Quebec Cheese?

Yes in colored cheese particularly, Speaking generally Quebec colored cheese are still irreguar in color, many of your factorymen evidently continue the old practice of guessing the coloring material instead of carefully measuring same from day to day. Very often we find even now one factory will make high colored cheese one day, medium colored the next and pale colored the next, all coming forward together, which seriously reduces our chance of selling these goods satisfactorily and well,

Will the consumption of cheese increase or decrease?

I think the consumption of cheese varies somewhat in Great Britain from year to year according to their relative value in comparison with other food products, but the British middle and lower classes still eat cheese and are likely to continue doing so.

What is your opinion of the prospects of our developing a Hog business for the British markets?

There is no doubt Canada can very largely increase her trade with the mother country in this direction if she will lay her plans so as to produce the right class of hog for our requirements. As you are no doubt aware, Britain imports some thirteen to fourteen million pounds worth sterling in Hog products annually Canada gives about £500,000 worth, not nearly as much as the Danes ship us although their country is so small. I am pleased to say, however, that the Canadian meat that does come forward, is very highly approxiated and the demand is much in excess of supply all the time.

It is useless to send us coarse, heavy, fat meat, we are receiving an abundance of such from your neighbors over the line, which sells all the way from 20 p. c. to 30 p. c. below the price current for extract should be diluted by at least of the vat or drainer.-Ed.

150 pounds, they must be very thin and mixing.

If your farmers would take up this enterprise in carnest they can very easily raise two crops a year properly. The best breed of hog is the Yorkshire crossed with Tamworth breed, special mild cure is also necessary.

I shall be glad to communicate with any merchants in your province contemplating going into this business, and always pleased to give you or them any information in my power with a view to develope this or any other interest to one mutual advantage.

ADVICE TO CHEESEMAKERS FOR JUNE.

By E. Bourbeau, Inspector-general of Syndicates.

Faults in June cheeso-Care-Buttermaking-Cream ripening-Washing unnecessary.

June cheese is generally thought to be good, though much of it is not quite perfect. After having shown the qualities required in cheese made in June, and given some special advice in order to help makers in producing a fine quality of cheese in that month, I will describe the principal faults generally found in the cheese made in June, and give the means of avoiding their commission.

QUALITIES,-1. Full flavor, rich, clean, and creamy.

2. Consistence and texture firm, though not dry, buttery, and the grain uniformly fine.

3. Colour glossy, unitorm, pale.

4. Appearance; clean, and symmetrical.

Advice on making.-1. Incite every patron to interest himself personally in the care of the milk delivered in his name. Secure for each patron a copy of the bulletin, on the care of milk, published and distributed, gratuitously, by the Dairymen's Association. Send your request for this to the Secretary, St. Hyacinthe, Que., giving him the number of patrons and your own address.

- 2. Before advising your patrons or finding fault with any of them about the way they keep their milk, see to it that there is nothing in your dress, person, in your factory, or in its surroundings that is not perfect as regard cleanliness. Wash out your whey-tub at least thrice a week. When every thing about the factory is irreproachable, then there is more chance of your advice being listened to.
- 3. Never use impure water even for washing up, and still less for diluting your rennet.
- 4. Keep a regular diary of the daily operations of making, as shown at p. 74 of "The making of Cheddar," by J. W. Decker. If you have not yet bought a copy of this little manual, get one at once, and send 50 cts, in stamps, to the Secretary, addressed as above.
- 5. Use as much rennet as will produce curl in such a way that it will be ready to cut, at a temperature of 800 340, in 30 or 40 minutes. For overy increase in the quantity of diluted rennet added to the milk, the proportion of salt added to the curd must be increased.
- 6. To ensure uniform presence of the rennet all through the milk, the rennet-

- 7. The milk in the vat should be perfeetly at rest when coagulation begins to be perceptible.. Loss is incurred by even the vibration of the floor when the congulation is going on.
- 8. Cutting the curd should be begun with the horizontal knife, and in the direction of the length of the vat: then, with no cessation, the vertical knife is to be used.

9. As soon as cutting is done, the mass must be stirred slowly and contimously; the maker must not stir briskly with the rake before the small pleess (technically "dice") of the curd are slightly scarred on the surface.

10. Heat is not to be applied till 10 minutes after the stirring has been begun, and then by degrees up to 980 or 1020, at the rate of a degree every 4 or 5 minutes.

11. The stirring must be kept up until the pieces of curd are "done" (cuits), so far that if a handful of them is pressed for a few moments they will separate of their own accord at the slightest far or folt.

The whey must not be run off until the acidity is show by the hot-iron test.

12. Stirring by hand "until the curd is firm," will improve the quality.

13. At first, the stirring must be done very slowly, and the temperature kept

14. The curd must be allowed to take en bloe," but only when it has become "dry" by stirring. It is better to stir the curd in the whey until the hot-iron test shows filaments 1/4 inch long, than to run off the whey before and allow the card to "take" (1) when moist.

15. It is only when the curd is dry enough, and when agration has been provided for, that it is right to let it 'make" and to settle much.

16. When once the curd has taken, it must be turned over often enough to prevent the whey from gathering tegether either in the interior or on the surface.

17. If gas forms, or the gard seems too moist, or if the acid develops too slowly, it must be aerated as much as seems necessary by breaking, cutting, or stirring, and than kept at a temperature of upward of 940.

18. The gas that forms in the card hinders the development of lactic acid; and the presence of lactic acid hinders the production of the gas that makes the card porous. The gas must be opposed by acrating the curd and keeping up the temperature above 910, or else by adding hot water, or steam to the vat, or to the drainer that contains

19. When the curd is beginning to feel slippery between the fingers, talles on the odor of fresh butter, and in its consistence is a little fibrous; and when, on being squeezed, drops of yellow fatty malter exudes from it, it is time to grind it.

20. After grinding, before salting, the curd is to be aerated and cooled by stirring for 15 minutes.

21. The salting is to be done at the rate of 21/2 to 3 pounds to the 1,000 pounds of milk, according to the more or

(1) According to the present mode of printing, i. e., by "linotype," no italies can be made, so we have to use quotation marks instead which is absurd. Ed.

(2) That is, we suppose to the bottom

less dryness of the curd, and the richness of the milk. The quantity of salt must be modified so as to compensate for any part of the curd that may have been carried off by the whey when the card was too moist.

22. Putting the curd into the moulds is to be begun when the rough surface, that the salt has caused on each bit of the curd, begins to be smooth and soft; this will take place in about 20 minutes after the salt has been stirred in. Delay at this point is injurious to the flavor, and also to the firmness of the texture.

23. Only perfectly pure water is to be used when bandaging the cheese.

24. The turned down flaps (rebords) . of the cheese display in a most disgraceful manner the want of care and skill in making up the cheese, and, on the English market, often lower the price by 2 to 3 shillings a cwt. Their formation may be prevented by our in the pressing and bandaging, and turning the cheese in the mould in the merning. Pressing must be done gradually, and the extreme force is not to be applied till 4 hours after the cheese has been put into the mould.

25. Turn the cheese in the moulds every morning; never take a cheese from the press until it is symmetrical in form and well finished off; always leave the cloths on the moulds.

26. Keep the drying-room as regularly as possible at 650 to 750.

27. Never store your cheese-boxes in the curring-room for, if you do, the cheese will imbibe the flavor of elm-wood, (1) and its taste will be affeeted.

The boxes must be solid, smooth in surface, clean, and just large enough for the cheese. Cheese in badly made hoxes, or which reach England in broken boxes, sell in consequence for from 3 to 4 shillings a cwt less than they ought to fetch.

28. The weight of each cheese is to be marked distinctly on each box; below the joining, and to the right hand.

29. Mark the word "Canadian" on the side of all cheese of the best quality and on the boxes as well.

FAULTS IN JUNE-CHEESE,-Fault was found fast year, 1896, with June cheese on account of bad aroma; and in some places a too great firmness united to a want of acidity.

BAD AROMA.-The cause of the bad aroma in many cases, was bad rennet. If you would avoid this, buy none but the best brands of revnet, guaranteed on the invoice not only as to strength but also as to aroma. Never use rennet that has not a pure smell.

To want of acidity must be attributed certain absences of aroma, net ably the aroma of fruit or sugar, as it is frequently called in the trade. As to "want of acidity", the following instance will show you what is to be understood by that term : In June, we often have very cool nights, in which the temperature falls very low; in such a case, the milk reaches the factory in a less forward state, and ought to be treated differently from the previous evening (?); but many makers add the rennet at the same degree of forwardness; from which it results that the curd will remain longer in the whey, and will consequently become very firm; now, the firmer the curd, the more acidity it requires, on account of the small quantity of moisture it contains; but, if the maker has not observed that the milk ought to be in a more forward state before being

(1) Why, we do not see. Ed.

renneted; he will not give it more acidity than usual; in which case, his curd, that he funcied was all right, will take on a bad aroma without his understanding whence the fault arose. Observe this : a cheese with this aroma is always more or less of a deep yellow in colour, and this is a sure sign of want of acidity. If the colour is pale, some other cause of bad arong must be sought for.

Too great firmness is due to an excesof working the curd, or to heating it to too high a temperature. When the cause of this defect is discovered, the remedy is easy of application.

If the cheese is short of aculity in .June, this is frequently due to the fact of young makers giving too much at the beginning of the senson. At the first sales, they are told that the cheese is too acid, and that leads them to dl minish the dose last at the time when they ought to begin to increase it, if they had given enough of !t at starting Makers, then, ought never to lessen the dose of acidlty in June, without considering that the cheese they have in hand is suffering for want of acidity; in this case they must never act on the report of the preceding sale.

TO BUTTER-MAKERS.

At the opening of a new campaign, a very peaceful one indeed, but, at the time, a very active one, in the preparation of our better for the foreign market, it will be useful for as to east a glance over the present situa tion, in order to thoroughly understand our position and our duty.

The increase in our butter exports has areased our neighbors of he United-States, and it is not without some dread that, in the course of the winter, we have seen disclosed the plan of their emujaign for the seizure, in our despite, of the Eaglish market. They have acted systematically, by spreading instruction abroad by means of their numerous experiment-statious, where courses in the throat and practice of butter-making are given, by establishing, either by the state or by private initiative, competitions in butter specially made for export; by multiplying cold-storages, by providing proper means of transport by sea and land, and by going so far as to organise the direct sale of their butters before they have lost their freshness. France, Ireland, Denmark have all done the same, it is their example, their success that have excited our desire to get a share of the cake, it is the read to success that non lies open to strong efforts and vigorous

Less fortunate than our neighbors, we have only one school, but we have, with it and our system of organised inspection, the power of exercising such a fairly efficient control, as to give reason to hope for tangible results. No peoples have better modes of transport we; and if our butters were put fresh on the English market. I think I am safe in saying that the buyer would not turn away from our goods in search of something better.

Makers of batter. I address you in hopes that you will respond to what is expected from you, and I take the liber ty of drawing your attention to the following advice which, in a summary fashion, I submit to your consideration

your factory perfectly clean. The donble vats, or double-bottomed vats, must (1) Not very profitable work for the

are many chances for the entry and wants from 2 to 3½ per cent. Instead forms a large hall 50 ft. x 30, containing development therein of all sorts of in of, as formerly, from 5 to 6 per cent. In one corner the water tanks, and being jurious germs, the smell of which is Take great care no neglect this change very harmful to butter. Disinfection, under the pretence that the more salt a gallon of water; if, in the spot where tidiculous pretext, we neglect our real the whey-tank stands, the soil is interest, and refuse to please the taste soaked with whey, eart it off, do not of our customers, how can we ever throw other earth over it, and make a hope to increase our utter-experts, wash-up water. If there is no fall to scale of butter-prices. lead this drainage stuff to a distance, And the "get up" of our butter must make a collecting tank, well covered no longer be considered of unimporin, and get a neighboring farmer to tant; the general appearance of the come and cart it off, to be used as mar tub or box must be attractive; the connure for his kind. (1)

On several occasions, in the "Jourhave not the experience necessary to enable them to properly ripen cream, many knots, and well seasoned. Heace it happens that there is so great a variety of flavors in our butters, that they do not seem to belong to the same family. One infallible means of judging of the value of a butter-maker's services, is to see if his butter is the same from day to day, and if the butfer of the next day can be added to that made the previous evening to finish a tub not filled up then.

Great and sudden changes of tempera ture occur during June, in consequence

by burning sulphur, should regarded the greater the yield, and for fear that as necessary and carried out every-your neighbor do differently from you where. Wash the floors with a solu- and pay his patrons more for their lighted, perfectly ventilated, and are tion of 4 to 5 lbs of chloride of time to $^{\rm I}_{\rm i}$ milk than you can. If, under such a drain to collect the wastage with the and reach the highest Jegree of the

sumer must be able to say; he who has taken the pains to make his goods nal d'Agriculture" and elsewhere, I look so tidy, has probably taken the have raised my voice against the too pains to make them palatable. Choose common practice of hiring makers who solid boxes, neatly made, and of pretty for at the rate of 80 cents per 100 lbs., shape, made of good wood, wihout too the current market price. If 2,000 lbs.

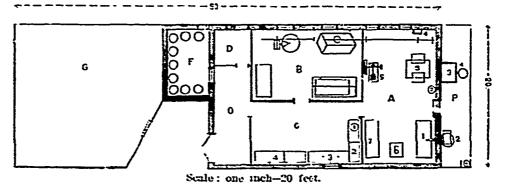
smell when being washed.

As a last piece of advice for the pre-

used besides as a hall for the directors and the meetings of the patrons. On the whole, the rooms of the dairy are arranged in such a way as to be well moreover paved with concrete, which prevents the infiltration of milk and greatly facilitates cleaning by means of water and steam. Let us see now how the milk is treated, in its different conditions, in this establishment.

THE SALE OF MILK.-The milk intended to be sold is bought from far mers at the current rates paid by the city milk dealers at the station of Ste. Therèse.

But, as to its intrinsic value, it is paid for according to the amount of fat it contains. For the sake of greater clearness, let us suppose the milk is paid are bought daily, the seller should The parchment paper should be just therefore receive 20 times 80 cents, wide enough to cover the butter without i. e. \$16.00. If this quantity of wrinkles either at the rides or on the milk contains 50 lbs. of fat, each top; it ought to be strong and emit no pound of fat must be north 20 cents. The farmer whose milk has 4 per cent of fat will accordingly resent, I beseech you to look well after ceive 80 cents per 100 lbs., but another your cellars and icehouses, lest they be whose milk has only 3 per cent will be damp. It is immediately after it is made entitled to only 60 cents. The milk that butter contracts that blemish, or must reach the factory in perfect condiallows it to develop itself, which makes tion. All milk having any defect, no 't unlit for exportation, at least as we matter how slight it be, is inevitably



be on the look out to avoid surprises. ream: I too high a temperature of fermentation; 2 allowing the fermen tation to go too far ; I, the unequal fer resulation of different parts of the A. C. C. C. C.

Cool the cream from the ere before chuming, and chum at a temperature lon in proportion to the high tempera are of the room, Rear in mind, that I is not possible to chara thin cream at so low a temperature as thick cleam

Washing builter is not a necessary peration; the use of pure water to wash batter with is tolerated for the sake of segmenting more completely and promptly the butternilk from it. but especially because the makers deof the operation, that what was once permissible is now imperative. At least, do not carry it too far, one water must the waste of muscular power if the work is done by the hand.

The quantity of salt used must be Keep both the Inside and outside of less and less, for the trade now only

be very carefully examined, for there farmer we fear. -Ed.

of which the cream ripens irregularly inought to send it. Protect it then by refused. It must be absolutely fresh, making a cold store, with a good ven- for the evening's milk must be pas-There are three things to be dreaded thator to renew the air, it does not cost teurized the same evening, for delivery and guarded against in the ripening of much, and without it your installation the next day. It is tasted before being ral be always incomplete.

> fully develop, I think I have touched since culting for the milk to be accepupon the weak points of our installa-, ted. The malk of any anamal manufesttions and our processes of manufacture. Ing. symptoms of sickness is retained I hope that these engaged in this basi- by the proprietor who notifies the comness will apprehend the importance and pany and, according to agreement, this

> national pride among us to make this se is verified (1) by a veterinary sursenson of 1897 a traumphant and profi- grow. The herds of the patrons table wasm for the Province of Quebec.

A MODEL DAIRY.

Having had occasion to visit Ste tole so little pages to the investigation Thérèse the 1st of May last, I had the good fortune to go through the establishment of the milk supply company of Ste. Thérèse. After having inspectal be enough in all cases, whatever may it, I cannot but regret that some of our have been the temperature of the butter-makers are not in a position to eream at the commencement of the visit it, as they might learn a very prochuraliss. The observation of this rule thindle lesson of chaliness and proper will prevent that excess of cooling factory management. The creamery which, uselessly, makes the mixing in at Ste-Thérèse is devoted to the sale of the sait more difficult, and adds to of milk and its products in three different conditions. It sells milk, cream and butter. The company occupies a bailding 100 ft. x 30, a diagram of which is given at the end of this article. Half of this building is devoted to the dairy proper, the other, to the fee-house. The (1) Does this mean "until upper part, above the rooms of the dairy, the disease is, etc."? BL

al he always incomplete. accepted. In the case of a fresh calved in these few notes, that I cannot now cow, at least 12 days must have elapsed ergent necessity of adopting my advice, wilk is placed to his credit and paid for There must be enough energy, enough as having been received, until the disenwho supply milk for pastenrisation are inspected, as also the stables, once a month by a veterinarysurgeon, at the expense of the company. Moreover, the patrons must not give to their stock other food than that the company has passed upon as sultable. The spot where the milk is delivered from the wagons is in concrete. so that any milk that may be spilled cannot soak into the ground and so prove a source of infection, as too often happens in a great many factories. The renunted space and the platform for receiving the milk are covered in so that the attendants are sheltered against the Inclemency of the weather. On the platform are placed shalves for the purpose of holding bottles containing samples of milk from each can to be tested. These samples are taken by

(1) Does this mean "until the cure of

means of a cau, of the capacity of thou. This price was, last year, from portion for every 50 lbs. of milk weighed, for the purpose of being submitted to the Babcock test every two weeks. A crane lifts the cans from the wagons and places them on the platform, raising them only a few inches. Here they have only to be tipped over in order to be is also placed on the platform, whence the milk runs through a 4 inch hole into a recenticle placed inside the building. From this basin which is supported on four legs at a height of eight inches shove the floor, the milk is pumped for distribution into the vessel supplying the pasteurising apparatus. This apparatus is simply a turbine whose sides are heated by the steam used in putting it in motion, and in case the quantity of milk to be pasteurised is considerable, by steam coming directly from the boiler, should the quantity imparting inction prove insufficient. The milk enters a funnel which delivers it by its lower end to the pasteurising apparatus. It is raised by centrifugal force up the sides, is heated to 1550 Fahrenhelt and escapes at the bottom, aft-a being rid, by the same centrifugal force of many impurities that could not otherwise be removed. The sterllising apparatus, manufactured by A. H. Barber, of Chleago, is capable of treating 1500 lles of milk per hour. As is well known, pasteurisation has the effect, not of entirely killing the microbes, but of paralysing them to the extent of preventing them from producing changes in the milk during at least three or four days and keeping it fresh and whole some during this period of time. The milk, after being sterilised, runs automatically into the bottling machine. which is manufactured by Porter, Blancimrd and Sons, N-hua, N. H. This apparatus bottles and measures at the same time. These bottles, patented under the name of "Common sense" are of white glass and are made in two sizes, holding respectively a plat and a quart. After being filled, they are stoppered with capsules of wood pulp; each bearing the date of bottling.

The empsule fits up against a shoulder in the neck of the bottle and is held in place by means of a wooden stopper pressed in by hand, thus hermetically scaling the bottle. Nothing can be simpler or more effective. The bottles before being filled, are, like the capsules. sterllised by steam, in a special box. nt a temperature of 2200 Fah. The filled bottles are immediately cooled down to 420 Fab. in 30 minutes, which finishes the process. The results of a omparative examination of the milk. both before and after pasteurisation, made by the bacteriologist to the Provincial Bureau of Hygiene, Dr. Wyatt Johnston, go to show that it becomes by this system of pasteurisation, per feetly neutralized, as regards most of the action that certain microbes exercise on non-pasteurised milk and is quite wholesome in so far as all hygienic requirements are concerned.

THE SALE OF CREAM.-The muk bought for the sake of the cream. whether the latter is intended to be sold or converted into butter, is paid for also in proportion to the amount of fat it contains. The only difference is that, instead of the price per hundred pounds being based on that received atmosphere during 24 hours. In whiter, from the city buyers, it is bought of a rate mutually agreed upon between the patrons and the company, due allowance being made for the fact that

about built a gill, which is the usual pro May to December, 62% cents. This milk is received and sampled precisely in the same way as that intended to be pasteurised. But, afterwards, the pump which withdraws it from the receptacle for receiving it, for the purpose of conveying it to the vessel supplying the centrifugal separators, heats the poured into the weighing vessel which milk at the same time it is being raised. This appliance is an automatically regulating hot air pump made by A. II. Reed, of Philadelphia, Pa. It raises and heats the milk and regulates its distribution in the supply vessel which is constantly kept half full and distributes it in accordance with the requirements of the pump into the ceatrifugal separators which are of the turbine type. The pump Is worked by a small five horse-power Leonard ongine which receives, along with the separating turbines, its supply of steam from works adjoining the establishment. These works furnish, at a rate agreed upon with the company, all the deam required for running the latter's machinery, the amount being that which would be furnished by a boiler of the capacity of about 15 horsepower. The cream, after leaving the centrifugal machines, which are two in number, is put aside, and, after the separation is completed, is conveyed by the sump into the vessel that supplies the pasteurising apparatus. There, it is treated like the milk intended for consumption, transferred in like manner to the bottling machine, scaled in large bottles by means of the same kind of expanles, and cooled in the same manner. The cream, thus sterilised, possesses all the good qualities of pasteurised wilk, and the milk intended to produce it is the object of as much care both as regards the way it is treated and received, as the pasteurised milk itself.

> THE SALE OF BUTTER -- Some of the patrons sell their milk to the factory for butter-making at the same price as those who dispose of theirs for the production of cream. Others bring their milk, paying three cents for making, and receive in return the price of their butter, but always in proportion to the pereentage of fat, the cost of making being deducted. Milk intended to be made into butter is accepted from the fourth day after calving. While so many precautions are not taken in accepting it, as in the case of that which is intended to be sold as whole-milk or cream, still considerable care is exercised in receiving it. It is sampled in the way indicated for the other milk and tested by the Dornic acetometer, for the purpose of determining the degree of acidity of the milk In the various cans. Normal achilty ranges between 16 and 20 degrees, as marked on the acetometer and all milk of these degrees of acidity is accepted: if it registers less than 16 it is rejected as being alkaline and producat by cows probably in an unhealthy condition; if it marks more than 20, it is considered to be too ripe and is strictly refused. The cream is separated by the process already mentioned. After leaving the separators, the cream flows antomatically into a receptacle, situated in a chamber specially set apart for this purpose. Here, the cream is left to mature in a pure and regulated a lactic ferment of pure culture,made by Hansen, is wided to correct the defects to which milk is liable in winter. The cream is churned in an ordinary box-

Vermont Farm Rotary machine. The churn and the worker are driven by the little Leenard engine mentioned above. A part of the butter is made into little pots weighing only a fraction of a pound and wrapped in parchment paper stamped with the comp pany's trade-mark, for the retail trade the other portion is put into tubs and sold to grocers. At Ste. Thorèse, the production of the milk has greatly in creased during the last fow years and quite a number of cows are made to calve during the winter months, with the result, that now, it is found to be comparatively easy to make a considerable quantity of butter having a fine flavour during this season.

THE ICE-HOUSE .- As I mentioned before, the company has a large ice-house 37 feet long by 30 wide. The inside is 34 feet by 27 by 9, giving S262 cubic feet or a capacity of 250 tons of ice. Beside it is a refrigerating chamber 10 feet by S. This refriger ator is cooled by means of large gal vanized iron pipes, 12 inches in diameter, placed 12 inches apart on one side of the chamber and at a height of is inches from the floor. They are filled daily with crushed ice. Each is provided with a tap at the bottom through which the water resulting from the melted ice may be drained daily. A large quantity of ice is used in cooling the cream for butter-mak ing, and a still greater amount for pas teurising the milk and cream, the tomperature of which is reduced from 1550 F. to 420 F. in the space of half an hour, as already mentioned. The filling of this ice-house costs the company about \$160

I think I have now referred to most coints that will be of any interest to the readers of the "Journal of Agriculture" concerning this establishment, to which I do not think I was wrong in applying the term model at the head of this article and about which I have gone somewhat minutely into details in the hope that the company that has rganized it may find imitators in the neighborhood of our towns.

J. C. CHAPAIS.

(Trans. from the French by

J. F. Hansen.)

CREAMERY OF STE. THERESE DE RLAINVILLE, CO. TERREBONNE.

A.-Sterilising and separating cham

- ber containing : 1. Vessel for receiving the milk.
- 2. Pump for heating the milk.
- 3. Vessel for supplying the separa tors.
- 4. Pump for skim-milk.
- 5. Motor.

See p. 242.

- 6. Pasteurising apparatus.
- 7. Bottling machine.
- R.-Chamber for the cream and butter-working. G.-Washing room containing: 1 Rab
- cock. 2 sinks, 3 jets of steam, 4 shelves. D.-Office.
- F.-Refrigerating room with cylindrical pipes to contain ice.
- G.-Tcc-house.

P.-Platform having I crave. 2 pairs of scales, 3 vessels for skim-milk. sminiated cans for returning the milk.

MILEING BY MACHINEBY.

(From the New England Homestead). The various attempts at making a machine which would successfully milk cows have as a rule resulted in failure, the skim-milk is returned after separa- churn and the butter worked by the not so much because of the inability of and a set of rollers grasp the text. By

the apparatus to draw the milk as from the lack, of sympathy which should exist between the dairyman and the dairy animal - in other words, the human element-hence the flow decreased rapidly and the soon became dry. There is a great difference even in human milkers. One man will get more milk from a cow than another-he may be more kind, have a softer touch or understand the cow better. At any rate, up to within the past few years, no machine has been satisfactory for any length of time.

Recently, however, two milking machines that give considerable encouragement to those who dislike to milk by hand, have been placed on the market. One is manufactured by a firm in Iowa and the other is made in Scotland. The first was invented by the Cushman Cow Milker Co. and the milk is drawn from the udder by means of suction. A set of cup tents, made of glass with close fitting rubber mouth pieces, are fitted to the cow's udder. These are connected by means of a rubber tube to an iron pipe which runs to the mile cans and thence by rubber hose to the vacuum chamber. To operate, the sir is pumped out of the machine and the vacuum chamber by hand power. The cups are attached to the teats of the cows. Spetion is applied and the milk tlows into the cups, through the rubber and iron tubes into the cans. This continues until practically all the milk is removed from the udder. The cows are best milked when in stanchious. The operator begins at one end of the line and puts on the cups, continuing until the other end is reached, when the first cow is milked and the cups can he taken off. The machine will milk ten to tifteen cows before it is necessary to pump it up again, the number of cows dispending upon the quantity of milk given. Seventy-five to 100 cows can be operated upon at once. One man can, under average conditions, milk 35 cows per hour. The machine does not cause the cows any uncasiness. They give down freely and bad kickers usually become quiet after a few milkings. For cleaning the apparatus, water is poured into the receptacle at the farther end and into each teat cup as it hangs suspended after use. Several hundred cows have been milked with this machine for some months.

The other machine the Thistle, is rade in Scotland and operates also by suction. It consists of a steam engine, air pump, with suitable piping, cans with nir-tight tops into which are fitted vacuum pipes, the test cups, etc. The special feature of this machine is the intermittent suction which has an effect similar to the sucking of a calf. The test cups are made wholly of rubber. The engine is started, the udder moistened and test-cups attached. Milk begins to flow at once and a cow is milked clean in from three to five minutes. The machine seems to have no bad effect on the cow, as she stands contentedly chewing her cod. The power required to operate when milking 10 cows is estimated at 1.8 borse nower. and can be supplied by a steam or gasoline engine. A picture of this machine will appear next week.

A third machine, patented by Dr Da Laral of Sweden, may become useful. It works on a principle entirely different from the two already mentioned and is operated by hand power, although he now has applied electricity. The apparatus is suspended under the cow

these rollers are drawn apart They then advance to the base of the teat, approach each other and descend to ward the tip, thus removing the milk. The whole is so placed that it ad justs itself to the udders of different cows, to the diminishing udder during the process of milking and any move ment which may be brought about by the cow changing position. A girth band with rod firmly attached in the middle is placed about the cow and on the rod the milking machine is hung. It is very light, being made of aluminum. Our picture of the De Lavat is the first ever published. The device is covered by patents in all countries and great expectations are indulged in for it, as was the case with the cream separator.

The milk drawn by any of the ma chines is not exposed to the air from the time it leaves the teat until It reaches the can. There is, consequently, no opportunity for dust or disease germs to reach it Decomposition does not set in so soon as when hand milking is the rule and the product is more wholesome.

The flock.

U. S. Department of Agriculture. Farmers' Bulletin No. 49.

SHEEP FEEDING.

(by John A. Craig)

Professor of Animal Husbandry in the University of Wisconsin.

(Under the supervision of the Office of Experiment Stations.)

(February 1867)

In feeding all classes of sheep there are general details that contribute toward satisfactory results. Among these may be include all those things that are conducive to the general health of the sheep, such as considerate treatment, cleanliness of troughs and racks healthfulness of the quarters in which the sheep are kept, regularity in feeling, and the use of such accesso ries as salt, pure water, and sulphur.

FEEDING BREEDING EWES, (1)

To exter into detailed discussion of the feeding of breeding ewes it will be best to divide the topic according to the season, and, in this way, present the subject of winter, spring, sum mer and fall feeling. Under elemate conditions permitting the breeding tlocks to have pasture throughout the year, what may be termed summer feeding would largely prevail at all times, so with such an understanding local conditions will not neversitate much variation from the course of feeding suggested.

WINTER FEEDING OF BREEDING EWES.

Breeding ewes require 10 to 15 square feet of space in a building, and ewer weighing from 150 to 200 pounds should

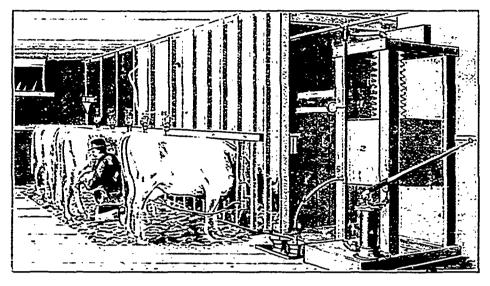
(I) In lamb ewes "must" have nitro genous food in some form. Hence the reason that Canadian farmers find pea-straw such a good food for sheep.

properly manipulating the machine, have an allowance of 1.5 feet at the feeding rack. Less than this causes too much crowding at feeding time, which often results in the birth of dead proaches, twice this amount of grain landle.

> side during the winter season, for in of the ewes. Overfeeding, especially this way they are induced to take some if associated with lack of exercise, will pound of oats and bran daily, which at exercise. With this in view, the folder be producive of disease in the flock the customary prices cost 1.5 cents. The

> such dry fodders as clover hay or cut Breeding ewes need not be fed more folds and grain will have an influence than twice daily. It is a good practice, on the amounts to be fed, but the conhow-ver, to feed them some folder out-trolling factor should be the condition may be taken some distance from the and it is likely to result in the birth of lewes averaged 177.2 pounds in weight

culent food, and the same weight of ceived its distinctive course folder, consisting of either alsike clover hay, corn cornfolder. As lambing time up folder cut into inch lengths, cut or uncut out hay, out straw, or blue-grass will be required. The quality of the lay. The sheep were very fond of the tine, well-cured alsike clover hay, and left only 16 per cent as refuse. Each ewe are daily 2 pounds of alsike clover. 2.8 pounds of corn silage with 0.5



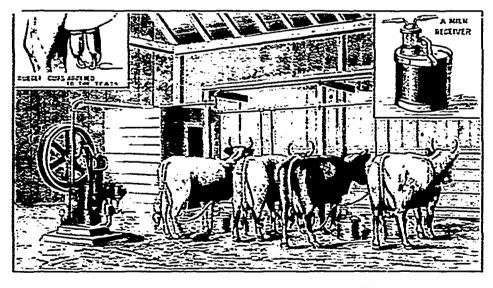
THE CUSHMAN MILKING MACHINE IN OPERATION.

1—Suction chamber, 2, Sand box weighing 1,200 lbs, used in keeping suction chamber extended. 4, Hand air pump. 5, Vacuum gauge. 7, Rubber air hose, 8, Valve. 9, Tubes attached to milk can covers. 10, Main milk pipe. 11, Rubber branches from main pipe to each cow. 12, Teat cups attached to udder. 13, Weight to give cups slight traction and keep tube from under cow's feet. 14, Teat cups not in use. 15, Water receptable used in cleaning main pipe.

building in which the sheep are housed, large weak lambs, while under-feeding at the beginning and 1962 pounds at In a practical way, the shepherd is equally favorable for disease and the should regulate the quantity of food birth of undersized lambs. Overfeedaccording to the condition of the ewes, ing may produce sterility, while under-if they have gone into winter quarters feeding delays the breeding senson. In thin condition, they should be fest The vigorous, firmfleshed condition 0.5 pound of outs or bran daily, cost-more heavily than if they were rat which results from liberal feeding and ing 1 cent. Their weight at the beat that time. Handling the ewes at in-junimited exercise is the aim of the ternals furnishes the lest indication experienced flock master.

the end of the experiment.

The ewes on the cut corn (ears removed) ate 1.75 pounds of corn forlder, 3.1 pounds of sugar beets, and ginning averaged 1524 pounds and at the end 163 pounds. The refuse, consist-



THISTLE MILKING MACHINE IN OPERATION.

We printed last week an elaborated article on recent progress in milking by machinery. The niticle described the English machine above illustrated. Tubes run from the rubber text cups to the receivers. Another set go from receivers to pipes in front of cows. These pipes are connected directly with the vacuum jump at the left. A set of cups enclosing the texts appears in the upper left hand corner, and in the same position on the right is a receiver.

as to their condition, and this will in- | COARSE FODDERS, Among the ing mostly of the thick parts of the diente the quantity of food that should folders for winter feeding may be men-stalks, was 20 per cent. We have feel be fed. In the author's experience the tound clover hay, pea straw, corn fed. corn fedder extensively, and the sheep ing flocks in a condition which the ge. As to their relative merits, based on. The ewes on uncut out hay ate 2.1 neral farmer would term "fat," and cost, the nourishment in them for sheep pounds of the lay, 2.5 pounds of own are firm fleshed, through abundant order given. feed and exercise, they are vigorous, At the Wisconsin Station 6 lots of 194.7 pounds at the end. The refuse Very few turnips, but a good allowance, and a healthy flock of lambs is likely. Shropshires, breading ewes, with 4 was 32 per cent. The lot receiving the of mangels; plenty of clover hay, but to be the outcome. In general, a breed-lewes in each lot, were fed one-half cut out hay are 1.5 pounds cut out hay. timothy-hay and corn-folder are no ing ewe weighing 150 pounds requires pound of bran or cuts and from 2.5 to 2.4 pounds of corn silage, and 0.5 better for them than good out-straw. Inly about one-half pound of such 3.1 pounds of succulent food per head pound cuts or bran, costing 1.2 cents. Ed grain as bran and outs, 2 pounds of such daily. In addition to this each lot re- They averaged 177.3 pounds at the

aim has always been to keep the breed der, out hay, out straw, and millet, seem to like it and thrive well on it. only good results in lambs have come and more especially the preference of silage, and 0.5 pount outs or bran. from this management. When ewes the sheep for them are about in the costing 1.2 cents. They averaged 175.6

pounds in weight at the beginning and

beginning and 182 pounds at the end of the trial. The refuse amounted to 35 per cent. No advantage was gained by entting the oat hay, and one of the objections to it was that the smalling to any other roots. Sheep are very pieces of straw would get into the neck wood, cause it to mat and, in some instances, drop away. The oats were cut when green, the kernel being just filled.

The lot on oat straw ate 1.1 pounds of this daily, together with 3.1 pounds of sugar beets, and 0.5 pounds of oats or bran, costing 0.8 cent. They averaged 155.5 pounds at the beginning and 156.5 pounds at the end of the experiment. The refuse was 22 per cent. When supplemented with the proper amount of grain and succulent food, out straw may be utilized for maintaining breeding ewes, but it is best to have other fodder to feed at intervals.

The ewes receiving blue-grass hay ate 1.5 pounds of the hay, 3.1 pounds of sugar beets, and 0.5 pound of oats or brain costing 1.3 cents. They averaged 148.2 pointle in weight at the begin ning and 153 pounds at the end of the trial. The refuse was 6.2 per cent. The sheep apparently were not fond of this hay, although the grass is eagerly eaten as it grows in the pasture.

Pen straw is greatly relished by sheep, and in nutritive value it leads all the other fodders mentioned, with the exception of the clover. In Canada, where the pea crop is a general one, the straw is not away especially for the sheep, and it is fed more extensively. perhaps, than any other folder, with cool results.

The hardness of the stems of tirothy imy seems to be one of the reasons why slicen do not care much for this fodder. They never appear to be eager for it, and if given any latitude in choice. they will leave it untouched in favor of any of the other folders, with the possible exception of out straw.

GRAIN-For the best results in thrift, wool growth, and lamb production, the breeding ewes should get some grain during the winter season. They can hardly be kept in proper condition otherwise. A good plan is to feed cats the first part of the winter, and then bran as lambing time approaches. About 0.5 pound of oats during the first part of the winter, and near lambing time I pound of bran per head daily will be sufficient for breeding ewes weighing from 150 to 200 pounds These are the two most satisfactory grain foods that are generally available both in respect to cost and results. Corn is not a satisfactory grain to ewes, as it produces too much fat, which apparently tends to accumulate interbally and impair the Investing qualities and lessen the general vigor, instead of imparting tone to the system.

SUCCELENT FOODS, Some succulent food should be fed to breeding ewes at all times, though it is very easy to feel them too much just previous to lambing. When turnips or silage are fed to breeding ewes in too liberal quantities, weak lambs (1) are likely to result Before hunbing, 3 pounds of any speculent food, such as mangel-wurzels, sugar beets, corn or clover silage, will be found sufficient. After lambing, unlimited quantities of

(1) And, with too many turnips, lots of dead lambs. We lost, in 1853, so many by this mode of feeding, out of a flock of 206 Hampshire-down ewes. that all profit for the year was lost. Ed. slightly the larger gain in weight pipe brooders and are fed and watered the picker frequently dips his hand or

these may be fed, to stimulate the milk flow.

Turnips are relished by the sheep, and the author prefers them for sheep feedfond of any of the varieties of relish Swedish turnips, and also mangel-wurzels near spring-time. Sugar beets are satisfactory if fed in small quantitles. In our trials, we have found that a ewe would eat daily 3.3 pounds of sugar beets, with 1.3 pounds of hay and 0.5 pound of oats or bran, costing about 1.3 cents. The ewes that were fed this ration averaged from 150 to 160 pounds.

Corn or clover silage, when well preserved, is a succulent food that may be fed to sheep with satisfactory re sults. It is cheap, is liked by the sheep, and if fed in quantities not exceeding 3 or 4 pounds per head daily it will give satisfaction. The corn kernels in the silage are one of the drawbacks to feeding it liberally. In five cents more per dozen than hen's our trial with corn silage it was found eggs. His egg tester consists of a lamp

These results show but a meagre difference in the feeding value of these foods.

The Loultry Aniu.

SIX TONS OF DUCK PER ACRE

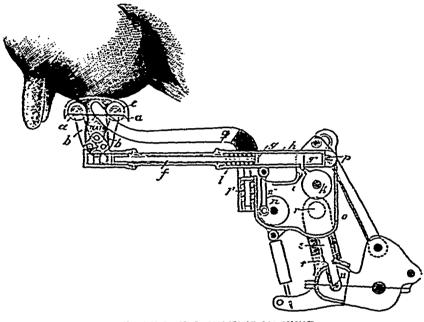
WITH WHITE OHICKENS THROWN IN.

What a Rhode Island man is doing.

PART II.

TESTING THE EGGS. INFERTILES SOLD

The eggs are tested on the fifth day, and the infertile ones are sold to cheap markets and to peddlers who supply bakers and restaurants, at the usual price received for ducks' eggs, or about



THE DE LAVAL MILKING MACHINE.

a a are the milking rollers. They receive their motion to and from each other by

a a are the milking rollers. They receive their motion to and from each other by means of the roof, which engage with one of the cogged segments formed on the arms or legs b b, while the other end is formed like a piston g, which moves in a cylender h. A projection g from this piston comes in contact with a projection i on an oscillating disk k. This latter can be replaced by a rotating eccentric disk. The movement of the roof is maintained in the other direction by means of spring l.

The up and-down motion of the rollers a is effected by a rotating disk n, which is connected to the cylender h by a pavot-link n'. Cylender h escallates round a pivot p on the frame o. The spring l tends to hold the cylender h in its upper position. During the movement downward of the rollers a the resistance or kicking necessary to effect the automatic adjusting or centering of the apparatus in relation to the teat is obtained by means of the convex plate c, which resis against the base of the teat and which is attached to the frame o of the apparatus by the arm g. The plate c is provided with a hole, into which the teat is inserted for passing downward between the rollers a a.

In order to altain the movability of the milking organ in every direction and in such a manner that this organ adjusts itself automatically to the tast according to the requirement of the latter, the frame o is moveable in a vertical plane around the pivot r and axially around a pivot s on the block t. The frame o, together with the block t, is, moreover, moveable in a vertical plane round the point u.

that ewes weighing about 150 pounds | luside of a box, in the front of which ate daily 22 pounds of the silage, 15 pounds of hay, and 0.5 pound of outs or bran, costing 1.2 cents. They gained more on the clover silage. The refuse from the corn silare was 6 per cent of all that was fed, and from the clover silize nearly 13 per cent.

As to the relative effects of silage and roots on the milk flow, the experiments at the Wisconsin Station were without very decided results. At the New-York Cornell Station this feature was studied more fully. As between mangelwurzels and corn slinge, the lambs sucking ewes fed roots made slightly better gains than those sucking ewes fed slinge, although the singe peared to be the cheaper ration. As corn silage between beets and the lambs of the ewes fed silage made is a hole several inches in diameter covered with rubber cloth, in which is an erg-shaped opening somewhat smaller than the eggs to be testel. Inside the box, back of the lamp, is fastened an ordinary lantern reflector, to concentrate the rays of the lamp on the egg. The tester is well braced and firmly placed, so that the operator can lean against it without stirring it. He does not put pans of water in the machines to makes the air moist, until the ducklings pip the shells, then but one pan is placed in each machine. As soon as the ducklings dry off and can stand. they are taken out of the egg trays and put in the bottom of the machine, where they are left from 24 to 36 hours with-

immediately. They are given a mixture consisting of bran, two-thirds, and corn meal one-third, and this is not cooked or scalded, but is mixed with cold water or skim-milk. He finds that the ducklings do just as well on uncooked food, and that it is unnecessary work to cook it. According to his experionce green stuff is not necessary in raising green ducks that are to be killed for market while young. His young ducks were not fed green stuff the past season. Bran answers his purpose just as well. When asked whether green crops that furnished both carbonaceous and nitrogenous matter would not have lessened his grain bill, he remarked that grain had been so cheap the past season that he did not think that it would, besides the fiesh of the young ducks would have been softer. His ducks, the marketmen say, are firmer and stand up better than others that are fed differently.

The above mixture is fed for the first four days, after which they are given a mixture consisting of equal parts of corn meal and bran, and seven or eight per cent of beef scraps. After this, the per cent of beef scraps is gradually increased. At three weeks of age, their food contains 15 per cent of leef : craps.

The mixture is fed up to the time they are killed. He does not leave off the bran, as some do to make them get extra fat, before they are killed, because he finds that they do not do as well with him. Leaving off the bran stops their eating. It might work with green food, but does not work without it. Feeding green food makes the ducks yellow, and they sell for less. White-skinned ducks and geese are demanded.

The green ducks are usually killed when eight weeks old, when they weigh about nine pounds per pair. Sometimes they are as heavy as 10 pounds per pair at that age. At 10 weeks, they average about 11 pounds per pair, and range from 9 to 14 pounds per pair. They are usually selected and killed when "fit," although the number killed depends upon the market price and the demand. Mr. Pollard keeps one picker who does nothing during the season but kill and pick ducks and fowls. This man will kill and prepare for market 57 young ducks in eight hours.

The ducks to be killed are confined in two coops in a room adjoining the picking place, to which access is had through hinged doors opening into the picking room. The ducks are thus shut up out of sight, and are much auto'er than if confined in sight of the killing operations. As these doors opening into the pens are about shoulder high, the picker can reach in and select one without stooping and with very little disturbance of the rest. The ducks are stock or bled by opening the bill and making a cross cut in the back of the throat on the inside, so that no wound shows on the outside. This severs the large arteries and pierces the brain and causes relaxation of the skin and muscles. Immediately after, they are struck on the head with a club, then held over a galvanized from pail to eatch most of the blood, and immediately picked. The picker sits in a chair drawn up alongside a box which is about as high as his knees, into which the feathers are placed. He lays the duck across his lap and holds its head between his knee and the box to prevent its fluttering, and that the blood that escapes out food or water. Then they are put out may go on the floor instead of on to the in the broader house under the hot water, feathers. As he removes the feathers,

fingers into a dish of water which is always within reach. This causes the feathers to stick to his hand, and ena bles him to remove them mer, rapidly and with much less exertion. In remov ing the pin feathers, they are caught between the blade of a knife held in the hand and the thumb. In this work the pin feathers are thoroughly wet that they may stick to the thumb and le more easily grasped and plucket. The neck, head and wings are not plucked; the feathers are left on and a string is tied around the body of the bird to bind the wings close to the body. They are never drawn except for private customers. Immediately after they are dressed, they are placed in a barrel or tank of ice water to remove the animal heat. and to shrink the flesh or make them more plump or compact. Here they are kept until they are shipped to market. When sent to New-York City, they are packed in ice, but this is not necessary in sending them to Boston and near-by points. Mr. Pollard sends green ducks to market from May 1 to about November 15, when the last are slaughtered. He supplies the markets in Providence Pawtucket and vicinity, and sells many ducks direct to the consumers, but the bulk of his product goes to the doulers in the large cities. Green ducks bring the highest price about May 1; from then until July, the price gradually falls From July to September, the price re mains unchanged, but after Sentember 1 again rises and, in October, queks that It has cost less to raise than the early ones, again bring good plices. In No vember, western ducks are sent to market in great numbers, and the price then goes very low.

PRICES RECEIVED.

Last April, Mr. Polland received as much as 60 cents per pound at retail. and 50 cents at wholesale for his earliest ducks. They then weighed about 314 pounds each. Two years ago, the whole of his first hatch marketed before dealers had re-cived ducks from elsewhere, brought him 5) cents per pound. Some of them were sold at this price when eight weeks old and weighing 9% pounds per pair. Last season his ducks were sold at wholesale as follows: April 25, 50 cents; May 1, 33 cents; May 9, 30 cents; May 15, 26; June 1, 21 cents; June 16, 19 and 20 cents; July 2, 18 cents. July 18, 16 cents; from August 1 to October 1, 11 to 16 cents. He expects that the price will go up to 18 cents by October 20, and then drop when the western ducks come in. As Mr. Pollard remarked, '50 cents per pound for young ducks is pretty good and counts up pretty fast so long as it lasts." He has taken pains to secure the best ducks that can be found and of late years has exhibited at the fall fairs and the winter poultry shows; as a result, the sale of breeding ducks has become an important parof his business.

He has been endeavoring to improve his ducks by increasing one depth and flesh development of the fore part of the bodies, and his breeding birds are. as a lot, very deep borded. This type of duck, he claims, will be the plumpest. heaviest and most atractive when dressed. With this deep bodied strain he won in close competition at the Boston Poultry Show most of the first prizes. (All but one, and it was afterward found that the bird that took it was disqualified, so he really was entitled to all firsts.)

(To be continued)

ARTIFICIAL INCUBATION

Reaumur's inventions - Copinleau-Ca pital required.—Testing eggs.

Reaumur devoted to this undertaking a long series of experiments, much arduous labour, and he even wrote a book of practical instruction in it.

Like the Egyptians did at first, he employed dung to raise a wooden oven to 104 degrees fahrenheit, which observation led him to think the best temperature. He sought for the means of regulating the heat of his manure hotbeds, with but poor success; since his methods nover are the same results twice. His inquiries into the best food for growing chickens; his inventions of brooders, "mothers" wrapped in sheep-skin, still employed, are most remarkable. The author of ornithotrophy, Copinicau (1783) succeeded Réau-

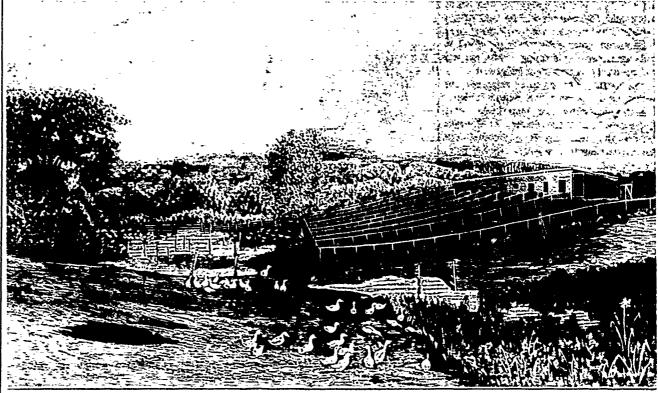
each hen, and one hen in ten that could sit. (What does this mean ? Ed.) What expense, trouble and labor !

With artificial incubation nothing is easier, it is truly an industry. The service of the hens is definitely suppressed, these have only to lay and be desinterested of their eggs to the highest point. A breed of hens that is rarely inclined to sit, must be selected and the incubation being done without the aid of the sitting hens, and without them also the raising of the chickens. The apparatus executes the work, to the general satisfaction. Of course, the instructions given for the operation of these valuable nuchines, must be stricty followed.

In the first place, before we can raiso chicks successfully, we must have conditions favorable to the process. They must of necessity have room for excrcise, to make them grow fast, be strong

the mind of the reader that there is money in the poultry business, with the same amount of money invested, than in any other industry. Yet, to make it successful requires experience, brains, and activity as well as any other occunation, you would not think of going into farming, the grocery business or any other branch of trade, and expect to make a large sum of money the first year or even for several years; but on the contrary, you would expect to pay for your experience, and education and make our money, afterwards, consesequently, if you go into the poultry business with the same view as you would enter into any other, you are bound to be amply repaid for your time and money invested.

Now, dear readers, as many of our poultry men and farmers are employing a valuable quantity of eggs for hatching purposes, we will try to save and healthy. We have observed one time and a large number of eggs by



BREEDERS AND BREEDING YARDS ON MR. POLLARD'S DUCK FARM.

mur, with an ingenious even, well are great difficulty; some people think that giving our method of testing eggs for ranged for the purpose : a wooden hut, with doubl, walls and linings receiving inwardly the eggs on shelves, and heated by a kind of fuel placed inside: the pipe for the smoke being placed at the top of the hut. This but was supplied with means of ventilation etc. all practical means of carrying on inall practical means of currying on incubation on a large scale, with artificial means of rearing chickens. But it is Ronnemain who carried artificial incubation to the present degree of perfection, by the discovery of heating the water in circulation, inventions for each phase of incubation, and an arrange ment of apparatus marvelously simple. He was the first to practice this industry on a large scale as a trade, and for a long time sold chickens hatched in this way on the Paris markets.

Since some twenty years, this indusfry has commenced spreading once over our country with fair success. It seems to use very useful to popularise it, and it is with that design that we will now work.

We do not want to insist upon the impossibility of finding enough sitting hens to obtain only one hundred chicks daily. It would take more than two thousand five hundred, at twelve eggs out. But I should like to impress upon

they can raise a large number of chicks with but a very small space to keep them in, so that the result has been very unsatisfactory to them in a financial Way.

In winter we have raised chickens, in small lots of 25, in brooders, and by allowing but 4 x 6 feet of floor-room for each lot, and kept them there until S or 10 weeks old, at which time they were ready to sell. But to raise them with success in that space, we must know how; they want more care, must be Rept clean, with pure water and proper food (see on later how to feed chickens in brooders.)

Now to come at people with such views as we have stated before, they nover succeeded in making money with the poultry business simply because they authoipated large returns with so to say, no investment of capital. Such people have done ceretainly more injury to the poultry trade than any other class, owing to the fact that they lacked in Judgment, and falled in what they called the poultry business. They will tell every one there is no money in the poultry business; and of course there was none for them, as they put none in, consequently could not get any

fertility, we have done thousands upon thousands of tests with different kinds of eggs. We will into this go briefly; but before testing, I must premise that you must select all eggs for incubation of a uniform shape and medium size; that is, avoid putting in all those that are very big or very small and mishapen. Now, we test eggs, at the 7th or Sth day of incubation, and only onco for each batch, but if you want to run a machine at its full capacity all the time. you can test at the 3rd day and still lay tresh eggs in place of these not being fertile, by testing in a dark and warm room, placing the new eggs warm with the others; of course they will hatch a little later. Now, take an ordinary lamp with good light and a bright chimney, cut a piece of pasteboard of a deep color about S inches square, and at the height of the light make horizontal hole in the form of the egg but a little smaller. Place this paste-board before the light, and very near the lamp, place the egg at that opening, now study it for a moment, and all the good or fertile in the batch will present the form of a spider if they have been kept at the right temperature between 101 and 101 degrees Fah. Now cull out all others, unless there are some with very

thick shells that you cannot see into Perfectly clear eggs may do for cooking purposes; they look like fresh eggs, keep aside all others to be cooked hard for the chicks, as all fertile eggs, are in the drawers keep them altogether just as in a nest, being close together they will have a more uniform heat. In our next article we will see how to feed and care for chickens in brooders, S. GAGNE.

THE CARE AND FEEDING OF CHICKENS IN BROODERS.

(Continued.)

It is pretty difficult to fix an exact guide for the care to be given to the chickens during their first age.

In each locality, poultry breeders have adopted different modes according to the resources they have at hand and everywhere the results are good. The best guide is expensed, although there is an indispensable quality to pass master in the art of raising fowls, just like other animals, we must be regular and have observation.

At two days a chick has habits that we must understand and know how to manage. Do not wait until the bird is sick to give him care; it would be too late and this, too, you will learn by practice.

It is the first days' care that demands the most attention; a chick must not cat before 24 or 30 hours after being hatched; we must give him time to digest the yolk of the egg that he has nearly all in the abdomen. If he eats before this operation is finished, the food will stay in his organs still hadly hardened, and cause him an inflammation often mortal. Many times, chicks die between the age of five and tex days old, in consequence of this first indigestion.

Now, before giving their first food, let us see if they are properly settled in the brooders. First, they must have warmth enough, not less than 50 degrees Fah., for the first ten days, after that age between 70 and 80 degrees will accommodate them well until they are five or six weeks old when they generally commence to roost and can dispense with the brooder.

Secondly, they want to be in a dry place, dry floor, whether wood or earth: in the brooder, we must have the best and cleanest material that we can give for that purpose, and first it is dry fresh sand from the river, it is the lest absorbent of moisture, bad smell; and lasts clean longer than any other this we have tried. Spread about 46 an inch thick of this sand on the floor and try to have always at hand a good supply of it ready for immediate use. Next comes chaff or cut straw. Allow 50 chicks for each brooder, or every other comparment, to be kept toget her, for, in ...r experience, we have found this number the best for the first three weeks when at that age they must be reduced to colonies of 25 and remain in other brooders or warra places; they are growing and they want more room. You can keep 50 in a lot provided they have not less than 4 x S feet of floor until they reach five weeks old; of course it demands also more space inside the brooder and a botter supply of pure air and ventilation. For the first two or three days give them only a small space round the brooder that they may understand quicker their warm nest, which they will know soon and learn promptly how to conduct their own cance.

Now for the first feed; we have not found anything better than the infertile or clear oggs, that we have taken from the inculator after being tested. they must always be saved for that purpose, cooked hard and crushed in the hand, or cut in slices given on clean little boards, or better small wood troughs 3 x15 and only one inch high. You will find these last very handy and economic for feeding crushed grains etc., etc. We find these eggs the best and most natural food they can have; indeed it is their first food they have provided for (the 50k of the egg) before hatching, it gives them strength and energy before and when the time to break their hard prison arrives. This same food makes them live 30 or 40 hours after hot bing without any other holp, and they keep as lively as crickets.

Next to esoked eggs for their first days is coarse dry catmenl given always in clean places, or in the troughs described before. They must always have that food before them, this grain is cheap when we consider it goes so far for young chicks, given with a few baked egg as stated; one pound of that oatmeal and a few infertile eggs will feed a fifty lot of chicks for all their first week. Never feed on eggs alone, it generally gives them diarrhoen; when once started is often difficult to remedy: prevention is better than cure. After their first week they are able to cat good whole wheat, also cooked lean meat, cut fine, given three times a week, and as like other beings they like variety, give them small cooked polatoes mashed and salted as for our own use. A little sait in soft food will be very much appreciated by our little pets, at the third week, and later on give them yellow corn meal scalded and well mixed with as much wheat bran. We have found a very simple and effective manner to prepare that food. I will tell you if possible for your benefit how to do it. Put half a bucket full of the meal into a tub or other clean vessel you may have at hand. pour in abort as much boiling water and a little salt, stir and mix well until you have it like the consistency of soft butter, it will swell much and nearly double Its volume in a few minutes, let it cool, and it will by cooling come thicker yet, the thicker you have it done, the longer it keeps fresh Now whenever you want it. It is always ready, take what you want and mix well with the same quantity of dry wheat bran, give them only what they can eat, when there is any left take it out that they may not spoil it, learn their appetite and you will know soon what quantity is needed to satisfy them. Milk of any kind mixed in their food if you have it is very good; corn, wheat, bariey and cats well mixed and ground coarse is a very good food given dry or a little moist with milk or water. This meal may be mized, too, with cooked potatoes, beets, turnips, cabbage, carrots, and any kind of cooked vezetables to make variety. When you prepare any kind of soft meal try to have it as dry as possible for any kind of sloppy food generally gives them diarrhoea. Bread soaked in milk and squeesed in the hands to let out the greatest part of the milk is good in moderate quantites. When once out in the air, chickens are not so particular about the food yet for that reason don't try to reed them with damaged grain or mouldy and sour food of any kind.

The best at the erd is the cheapest.

Now chickens must have always before them clean and pure water with small vessels fixed in such a manper that they may pass only their head, this will keep the water cleaner.

S. GAGNE. (To be continued).

The Orchard and Garden.

WAXES FOR GRAFTING AND FOR WOUNDS.

1.—COMMON RESIN AND BEES-WAX WANES.—Reliable wax.—Resin, 4 parts by weight; beeswax, 2 parts; tallow, 1 part. Melt together and put into a pail of cold water. Then grease the hands and pull the wax until it is nearly white. One of the best waxes, either for indoor or outdoor use.

2.- Resin, 4 pounds; beeswax, 1 pound; tallow, 1 pound.

3.—Resin, 6 pounds: beeswax, pounds: linseed oil, 1 pint.

4.-6 pounds resin, 1 pound beesway, and 1 plut linseed oil; apply hot with a brush, oue-eight of ah inch thick over all the joints.

5.—FOR WARM WEATHER.—i pounds of resin, 1 pound of beeswax, and from half to a pint of raw linseed oil; melt altogether gradually, and turn into water and pull. The linseed oil should be entirely free from cotton-seed oil.

6.—Resin, 6 parts: beeswax, 1 part: tallow, 1 part. To be used warm in the bouse.

7.—Resin, 4 or 5 parts: beeswax, 114 to 2 parts: linseed oil, 1 to 114 parts. For outdoor work.

S.—LEFORTS LIQUID GRAFTING WAX or ALCOHOLIC PLASTIC.— Pest white resin, 1 pound; beef tallow, 1 ounce remove from the fire and add 8 ounces of alcohol. Keep in closed bottles or cans

9.-ALCOHOLIC PLASTIC WITH BEESWAX. Melt 6 parts white resin with one part beeswax; remove from stove and partially cool by stirring, then add gradually—with continued stirring—enough alcohol to make the mixture, when cool, of the consistency of porridge. In the temperature of the grafting-room it will remain sufficiently plastic to permit applying to the cut surfaces with the tinger.

10.- ALCOHOLIC PLASTIC WITH TURPENTINE.—Best white resin, 1 pound; beef tallow, 1 ounce; turpentine 1 ten spoonful; add enough alcohol 113 to 15 fluid ounces or 95 per cent alcohol) to make the wax of the consistency of honey. Or, less alcohol may be added if the wax is to be used with the fingers.

(To be continued).

(Extracts from the "Horticulturist's Rule Book" by L. H. Bailey.)

APPLES.—Keep the fruit as cool as possible without freezing. Select only normal fruit, and place it upon trays in a moist but well-ventilated cellar. If it is desired to keep the fruit particularly nice, allow no fruits to touch each other upon the trays, and the individual fruits may be wrapped in tissue paper. For market purposes, pack tightly in harrels after the apples have shrunk and store the barrels in a very cool place.

Some solid apples, like Splizenburgh parsnips and salsify and Newtown Pippla, are not injured after they are frozen.

by hard freezing, if they are allowed to remain frozen until wanted and are then thawed out very gradually.

Many apples, particularly russets and other firm varieties, keep well when buried after the manner of pitting potatoes. Sometimes, however, they taste of the earth. This may be prevented by setting a ridge-pole over the pile of apples in forked sticks, and making a roof of boards in such a manner that there will be an air-space over the fruit. Then cover the boards with straw and earth. Apples seldom keep well after removal from a pit 12 spring.

Apples may be kept by burying in chaff. Spread chaff—buckwheat-chaff is good on the barn-floor, pile on the apples and cover them with chaff and fine broken or chopped straw 2 feet thick, exercising care to fill the interstices.

CELERY.--For market purposes, celery is stored in temporary board pits, in sheds, in cellars, and in various kinds of earth pits and trenches. The points to be considered are, to provide the plants with moisture, to prevent wilting, to prevent hard freezing, and to give some ventilation. The plants are set loosely in the soil. There are several methods of keeping celery in an ordinary cellar for home use. The following methods are good:

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Select a shoe or similar box. Bore one-inch holes in the sides, four inches from bottom. Put a layer of sand or soil in the box, and stand the plants, irimmed carefully, upon it, closely together, working more sand or soil about the root part, and continuing until the box is full. The soil should be watered, as often as needed, but always through the holes in the side of the box. Keep the foliage dry.

Celery may also be stored and well blanched at the same time, in a similar way, by standing it in a barrel upon a layer of soil. Some roots and soil may be left adhering to the plants. Crowd closely, water through holes near the bottom as in case of box storage, and keep the plants in the dark, Blanched celery can also be preserved for a long time by trimming closely and packing upright in moss inside of a box. A large quantity of the vegetable may thus be stored in a small space.

ONIONS demand a dry cellar, and the bulbs should be thoroughly dried in the sun before they are stored All tops should be cut away when the onions are harvested. If a cellar cannot be had, the bulbs may be allowed to freeze, Jut great care must be exercised or the whole crop will be lost. The onions must not be subjected to extremes of temperature, and they should not thaw out during the winter. They can be stored on the north side of a loft, being covered with two or three feet of straw. hay, or chaff to preserve an equivable temperature. They must not be handled while frozen, and they must thaw out very gradually in the spring. This methed of keeping onions is reliable only when the weather is cold and tolerably uniform, and it is little used.

ROOTS of all sorts, as beets, carrots, salsify, parsnips, can be kept from wilting by packing them in damp sphagnum moss, like that used by nurserymen. They may also be packed in sand. It is an enreoneous notion that parsnips and salsify are not good until after they are frozen.

SQUASHES. Should be stored in a on straw under the glass of cold fradry room in which the temperature is uniform and about 50o. Growers for market usually build squash houses or rooms and heat them. Great care should be taken not to bruise any squashes which are to be stored. Squashes procured from the market have usually been too roughly handled to be reliable for storing.

PRESERVING FRUITS FOR EXHI-BITION.

CORROSIVE SUBLIMATE: which is a violent poison, is prepared at the rate of half an ounce to a gallon of water. Renew the liquid every year or two. Distilled or other very pure water shoul i be used if it is desired to retain the color of the fruit, and glycerine may be added to prevent the fruit from sbrinking.

Sulphur is sometimes used as follows: Put 30 gallons of water in a 40 gallon barrel; float on top of the water a tin pan, in which put a little sulphur. Ser the subdur on fire and cover the burre tightly until the fire goes out; renew the sulphur several times, opening the faired for renewal of air between the doses. The water absorbs the sulph irous acid, and the fluid is then used as a preservative.

A BARBED WIRE TELEPHONE SYSTEM.—On at least one ranch in California, telephone communication is established between the various camps, and also with the public system, by means of barbed wire fences. Insulators are not required; the lines are raised over the gateways. Thomas Flint of San Benito Co., who has this system in practical use, writes us that the wire fences will not carry as many connections as a single wire insulated. but that in a general way this novel telephone is a success. Other similar systems are reported from Texas.

DAIRYING IN ARGENTINE. - AIthough essentially a grazing country, the butter and cheese industry was practically unknown 20 years ago, and imports were \$300,000 annually . This is partly changed and the republic has become an exporting country to a small extent, possibly the beginning of an important increase. The custom prevails in that country of allowing the calf to run with its mother in the open pastures and cows must be tamed be fore they will submit to daily milking

COST OF SEED DISTRIBUTION .-Congress has appropriated \$130,000 for purchase of seed during the year ended June 30, '97, and an additionnal 20% 600 for testing, inspection and all other expenses of distribution. This 150,000 however, by no means covers the entire cost of tax-payers. Secretary of Agriculture Morten estimates that the cost to the postoffice department of handling this amount of seed is 100.-000. The total weight of the seed our classed is over 1,200,000 lbs., and the verctable and field seeds would plant 227,000 acres of 355 square nules.

TOMATOES.-Pick the firmest fruits just as they are beginning to turn. leaving the stems on, exercising care not to bruise them, and pack in a barrel or box in clean and thoroughly dry sand, place the fruits so that they will not touch each other. Place the barrel in a dry place.

In the autumn when frosts appear.

mes, will continue to ripen until near Coristmas, Fruit ripened in this way seems to be as good as that ripened naturally on the vines. Green but fullgrown tomatoes may be gradually ripened by placing them in emploards or bureau drawers.

The ripening of tomatoes may be hastened ten days by bagging them as grapes are bagged.

GRADING AND PACKING FRUIT. -A first-class apple, pear, or other tree fruit is one which is full-grown, of normal size, symmetrical, characteristic of the variety, wholly free of blemishes of insects or fungi, and not overcipe. In apples, pears and pluras, the stem must be left on if the specimen is to be first class, but in peaches, apricots, quinces and oranges, the stem remains upon the tree or, at least, is not necessary to a first-class fruit.

Second-class fruits are generally considered to be those which fall below first-class and which are good enough for marketing. They are sound enough to keep well, are fairly uniform in size and shape, but may have more or less surface blemishes, A small, dry wormhole in the blossom end of an apple or near makes the fruit second-class.

The greatest care should be exercised in packing fruits for market. Apples and pears which are to be shipped in barrels are commonly packed as soon as they leave the trees, but if the fruit is to be used for winter storage, it should be allowed to sweat and shrink before barrelling. These processes may be allowed to take place in piles in the orchard or in bins under cover, but the fruit should be generally kept cool. The piles should be in the shade of trees if possible, or, if under cover in a cool shed or barn, as under a north or a shaded roof. The first layer of fruit on either end of the barrel should he "faced," by placing the fruits in concentric rings around the head with the stem end next the head. After the lower end is faced, fruit of uniform grade is carefully poured or placed in. the barrel being lightly shaken once or twice to settle the fruit. The upper end should usually be faced like the lower end, and the fruit should stand an inch or less above the rim of the barrel before the head is pressed in. The shipping-mark is usually placed on the opposite head, or the one which stood on the ground whilst the packing proceeded, and this then becomes the top end. Merchants frequently turn the barrel over and open the other end, however; hence this should be faced as advised. Sprayed fruits shrink less and keep longer than unsprayed samples.

Perishable and dessert fruits which are shipped in baskets or other smaft packages, should be carefully laid in one by one, in layers. They will then ship without settling. See that the packages are full when they leave the packing-house. Care must be exercised not to rub the bloom off grapes and plums. Grane clusters should have all imperfeet berries cut away before packing. If berries are pleked when dry, and cooled off before packing, they may be simpord in tight unventilated packages.

(The Horticulturist's Rule-Book, by L. H. Balley.)

down on the soil. Cover them with soil to the depth of 6 or 10 Inches, covering very lightly at first to prevent heating-unless the weather should quickly become sovere-and as winter sets in cover with a good dressing of straw or coarse manure. The cabbages should be allowed to stand where they grew until cold weather approaches. The storing beds are usually made about 6 or 8 feet wide, so that the middle of the bed can be reached from cither side, and to prevent heating if the weather should remain open. Cabbages quickly decay in the warm weather of spring.

Cabbage for the family use is most conveniently kept in a barrel or box half buried in the garden. Cabbages and turnips should never be kept in the house cellar, as when decaying they become very offensive.

ORYSTALLISED ORGLAGE PRUITS -The principle is to extract the juice from the fruit and replace it with sugar syrup, which hardens and preserves the fruit in its natural shape. The fruit should be all of one size and of a uniform degree of ripeness, such as is best for canning. Peaches. pears and similar fruits are pared and ut in halves; pl ms, cherries, etc. are pitted. After being properly prepared, the fruit is put in a basket or bucket with a perforated bottom and immersed in boiling water to dilute and extract the juice. This is the most important part of the process, and requires great skill. If the fruit be left too long, it is over-cooked and becomes soft; if not long enough, the juice is not sufficiently extracted and this prevent perfect absorption of the sugar. After the fruit cools, it may again be assorted as to softness. The symp is made of white sugar and water. The softer the fruit, the heavier the syrun required. The fruit is placed in earthen pans, covered with syrup and left about a week. This is a critical stage, as fermentation will soon take place, and when this has reached a certain stage the fruit and syrup are heated to the boiling-point, which checks the fermentation. This is repeated, as often as may be necessary, for about six weeks, The fruit is taken out of the syrup, washed in clean water, and either placed or crystallized, as desired. It is dipped in thick syrup, and hardened quickly in the open air for glacing, or left to be hardened slowly if to be crystallized. The fruit is now ready for packing, and will keep in any cli-

(The Horticulturist's Rule-Book,

By L. H. Bailey.)

NOTES ON SOME FAMOUS OLD GARDINS.

(By Sir James M. Le Moine, F. R. S. C.)

I

"God Aimighty first planted a garden;aml, indeed, it is the purest of human pleasures." Lord Racon.

Downing aptly remarks that "the love of country is inseparably connected with the "love of home," therefore whatever tends to make home more CABBAGE.—The most satisfactory enjoyable, more attractive, tends to method of keeping cabbages is to bury strengthen man's patriotism, and make them in the field. Select a dry place, him a better citizen." The adornment tomatoes, if carefully picked and laid pull the cabbages and stand them head of rural homes, such is the mission and into the figures.

aim of the modern horticulturist-shall we, with Shenstone, call him the kind scape gardener?

"Landscape gardening is an artistic combination of the beautiful in nature and art-an union of natural expression and harmonious cultivation, capable of affording the highest and most intellectual enjoyment to be found in any cares or pleasures belonging to the soul."- (Downing).

"Gardening as an art of design and taste is certainly of very ancient date. " Of the first garden of all-that of Edon, we have no exact description. The beautiful ideal evoqued by Milton is striking. We are told of fairy brooks

"With mazy error, under pendant shudes.

Ran nector, visiting each plant, and fed Flowers worthy of Paradise, which not nice art

In beds and curious knots, but wature DOO:

Pour'd forth profuse, on hill and dale cest plain. Both where the morning sun test

warmly smote The open field, and where the uppler-

ced shade Imbrown'd the noontide bowers; thus was this place.

A happy rural seat of various view.

This bright inspiration furnishes a curious contrast with the kind of garden so keeny satirised by Pope, in 1713

"Inventory of a Virtuoso Garden"in the "tonsile" style: (1)

Adam and Eve in Yew; Adam a little shattered by the fall of the tree of knowledge in the great storm. Eve and the serpent very flourishing.

Noah's ark in Holly; the ribs a little camaged for the want of water.

The Tower of Babel not yet finished. St. George in Box; his arm scarce long enough, but will be in condition to slick the Dragon next April.

Edward the Black Prince, in cypress. A pair of giants stunted, to be sold

An old maid-of-honor in wormwood. A topping Ben Jonson, in laurel.

Divers eminent modern poets, in bays, omewhat blighted.

A quick-set hog, shot up into a porcupine, by being forgot a week in rainy weather.

A lavender pig with sage gowing in his belly."

Grazzl, indeed, were some gardens in the olden time.

The gardens of King Solomon,-the gorgeous gardens of Cyrus, who, according to Nenophon, had himself surrounded, wherever he journeyed in his domains, with the choicest products of nature; the famous hanging-gardens of Babylon; the rustic alcoves of the Greeks and Romans; the Vale of Tempe; the Academicus of Athens; the luxurious villas of the Emperors Nero and Adrian-can be quoted as instances of the appreciation by the ancients of the beautiful in natural adornments.

Had not also Cicero a classically famous villa at Arpinum, and Pliny one at Tusculum? The gardens of the an cients open out quite an interesting study. Centuries will clapse ere we light on a style of rural embelishment, very different from that of the Persians, the Greeks and the Romans; we mean the stiff, geometric style of gar-

(1) Box, yow, and holly-trees shorn

dens and pleasure-grounds, and the tonsile or Dutch style for years adopted all over Europe.

The stiff geometric style and its straight lines is now a thing of the past; the picturesque, the serpentine line or avenue has taken its place, as well as that of the tonsile method, which gloried in distiguring and distorting trees, plants, hedges, so as to assume the shape of peacocks, monkeys, fortifications and other vagaries. Martial, in his epigrams, attributes its invention or introduction to Canons Mutius, though some modern writers thought It peculiar to Holland. On reading the description of Pliny's garden, one is led to believe that early French and Dutch Gardens were laid out of the lines of that of the illustrious Roman.

Old writers point to the use of glass by the Romans, in the propagation of exotic plants and flowers. Plato and Columella mention shrubs of rapid growth brought from India and Arabia. Tiberius boasted of being able to ripen cucumbers "fere toto anno"nearly the whole year round. Seneca rates his countrymen, who are not satistical unless they can procure roses in winter, and spring flowers at the hibernal equinox; he also alludes to the agency of hot water, in the cultivation of some foreign plants.

The Medici, in the middle ages, were the munificent patrons not only of letters, but of the gardener's art as well-Although their gardens were laid out on the architectural, geometric lines all Europe adopted them as models they obtained in England, until the advent of the natural style, advocated by Bridgman, Kent, Wright, Repton, and praised by Addison, Pope, Shoustone, George Mason, Whately, Gray and others. Alexander Pope has left a charming description of the lovely gar den laid out by him round his pretty Roman villa, at Twickenham on the Thames.

How little now remains of the fairy domain !- not even the legendary Weep ing Willow, from the cutting Lady Sylvins sent him from alroad, the first tree of the kind introduced in England the tree died, in 1801.

The art of laying out public gardens received a great impetus from the genius of Le Notre, the first gardener of Europe, during the reign of Louis XIV., as the gardener's art, as well as "better lettres," benefited by the munificence of the "grand monarque" at Versail ies.

I shall never forget the pleasurable impression made on me, on taking in the panorama of this fairy spot, its "parterres, jets d'eau," ponds and plantations, seen from the terrace sur rounding the castle. Terrace, park. gardens, avenues and reservoirs are nearly all in the same state as when created by Le Notre, at the cost of millions, two and a half centuries ago.

Could any doubt have arisen in my mind as to the ornate style adopted, a single glance sufficed to indicate the school and the master. 'Twas not the natural style-'twere the rules of geometry, but geometry happily blended with architecture, sculpture, statuary, lawns, trees, flowers, pools-an exquisitely bright speciacle; a grand, soleun, though possibly out-of-date arrangement-in harmony, however, with the ideas of art prevailing at the time at Versailles.

Le Notre's theories struck root in foreign lands, far from the "flowery banks of the Scine," and for fifty years | mund's Burke's place.-Ed.

flourished in England, where Le Notre was summoned by *Charles II, long after the incroduction of natural gardens-styled in France "Jardins Anglals". The most renowned gardeners in France, after Le Notre, were Girardin, Morel and Delille. Le Notre decorated the famous gardens and labyrinth Cardinal Wolsey had created at Hampton Court, and the pleasure grounds at Greenwich and St. James Park. About this time the Dukes of Devonshire and Lauderdale, Lords Essex, Capel, Pembroke, Northampton, (2) were turning their attention to beautifying their domains, English landscape gardening soon found its way to Germany: several wealthy German Barons adopted it in laying out their grounds. The grand old English gardens, in their arrangement and ornamentation, reflected that age which had ushered them in exist-

"Nonsuch, Theobalds, (2) Greenwich, Hampton Court, Hatfield, Moor-Park, Olatsworth, Beaconsfield, (3) Cashiobay, Ham, and many other," says William Howitt, "stood in all that stately fromality which Henry and Dlizabeth admired; and in which our Surreys Leteesters, Essexes, the splendid nobles of the Tudor dynasty, the gay ladies and gallants of Charles II. 's courl' had walked and talked, in fluttering and glittering processions or flirting in green alleys and bowers of topiary work, and amid figures in lead or stone, formtains cascades, copper-trees dropping sudden showers on the astonished passers under, stately terraces with gilden balustrades and curious quincunxes, obe lisks and pyramids,-fitting objects of admiration of those who walked in high heeled shoes, ruffs and fardingales, with fan in hand, or in trunk hose and laced doublet."

Such are some of the notes and extracts furnished me by the Gardener's Chronicles for the past.

I purpose in my next adding a few remarks in connection with ornate modern gardens in Canada.

J. M. LE MOINE.

Spencer Grange, Quebec. (To be continued)

The Household Matters.

After such a winter as we have just gone through, too much stress cannot be laid upon the necessity of thoroughly cleansing every house where there has been sickness of any sort. And still more so, where the sickness has been of a contagious nature. The clothing of the sick, as well as the contents of the room, should undergo the closest scrutiny.

It is very little good to shake out, air a little, and pack clothes away. Stronger remedies must be reserted to insure against a future outbreak. There is safety only in fumigating the room, with all its contents, where the patient has

This must be thoroughly and well done.

(2) And more especially, Sir William Temple, at Moor Park, to say nothing of the great Lord Bacon and John Evelyn. Shenstone's life, in Johnson's "Lives of the Poets," and Hugh Miller's visit to Shenstone's garden, in his "England and the English," worth reading.—Ed.

(2) Pronounced "Tibbalds."

(3) Pronounced Becconsfield: Ed-

The windows should be pasted over, and every other crevice, where there is any danger of escape, scaled up.

Set a pan containing sulphur in the middle of the room, stand it in some other vessel where there will be no danger of fire, and when all is ready, set the sulphur on fire, shut the door and stuff up well even the key-hole, do this well and leave the sulphur to do its work, which it will do if given plenty of time. After this, soap and water with plenty of air, will do the rest.

If people would only use a little common sense, and enquire into the nature of the malady before visiting the sick, lining attached to the collar,

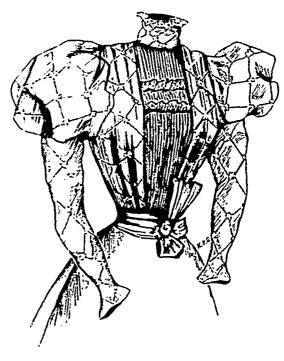
wash, for otherwise they may be a source of danger to other people.

Disagreeable Dutles. - You picture yourself the beauty of bravory stend-fastness. And then some little wretched, disagreeable duty comes which is your martyrdom-the lamp for your oil-and if you do not do it your oil is spilled.—Phillips Brooks.

ILLUSTRATION.

This waist is a very handsome one and not very difficult in its making.

The centre or front, is fastened to the



they would sometimes save themselves, and their friends much suffering.

In March last, a servant was ill with measles, many friends called, but only one was let in to see her. This was on a Sunday; after staying some time, sho went home to her duties.

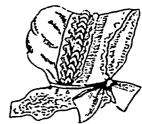
About the middle of the week, she begain to feel very unwell, but did her usual work up till Saturday.

The Doctor was called in on the Sunday morning, who said she was suffering from supressed measles, and before night she died. Poor girl! a life thrown away carelessness.

CONSUMPTIVE PATIENTS.

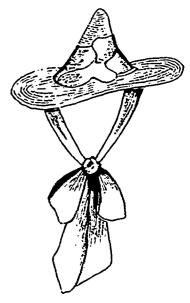
When you have to deal with a con sumptive patient remember that the great danger attending his case (in reference to other people) is the drying up of the matter he coughs up from his lungs, which contains the germs of the disease. It is not at all probable that the breath of a consumptive patient is infections, but the coughed-up matter certainly is. When it dries the germs may he diffused through the air, and thus come to infect healthy persons. The proper course to pursue is to receive the expectoration into splittoons which contain a sufficient quantity of a disinfectant-such 29 carbolic acid or Izal, or perchloride of mercary-and after use the spittoons should be scalded with boiling water, and a fresh quantity of the disinfectant placed therein. Handkerchiefs used by consumptives should be similarly disinfected, or be at once hoiled. It is better to use soft rars, which can at once be burnt. Such procautions should enable us to prevent somewhat the horor of this grave disease. For the public safety it is of the horrid white starched collar and extreme importance that the handkerchiefs of a consumptive patient should be disinfected before being sent to the them, but wise people wont be so tor-

The rest is held in place by the belt. The puffs on the sleeves are getting smaller every day; some sleeves are made with just a couple of deep frills on



SUN BONNET

the shoulder. I am glad to see the nice, trim lookings shirt-waist, is still very fashionable, but am truly sorry to see



GARDEN HAT

cuffs to be worn with it come back. One comfort is: let those who like wear tured. I heard a demoiselle exclaim, the other day; "Oh! these horrid collars;" why wear them?" said he, friend, "I can't help it, she replied, they are fas tened to the waist.

The sun bonnet for very young peoply, seems far preferable to the straw hat. which is oftener seen hanging at the back of a child's head than doing its duty as a cover for the same, and is a real landerance to play.

THE SUGAR LOAF HAT.

Is still a favorite with many and is nice and cool to the head.

Children like it for other reasons : one is they can easily convert it into a basket, in which to carry wild flowers or any other collection. The the two strings together, and there is the basket

OPEN WINDOWS.

There is great difference of opinion among housewives as to the advisability of keeping open windows, according as they are influenced by early education and prejudice, theory of draughts, and care of window garniture. The advantages and disavantages are equally obvious. We shall regulate our conduct in this matter by the weight we are inchned to lay on different considerations. There can be no two opinions as to the Leneficial effects of a constant supply of fresh air in our rooms. As our houses are at present built, this can only be ensured by having our windows partially opened all the year round when the rooms, if kept thoroughly clean, will smell as sweet as out of doors.

The greatest objection that most people urge against this practice is the danger of draughts. Now, to a healthy person of normal temperature, accustomed to much open-nir exercice, a draught is not an inevitable death-trap. Moreover, one need not elect to sit in a direct line with the door and window if a cold current is felt. But many women have an utterly unreasonable horror at the sight of an open window, even in summer. "Excuse me, I have such a dread of draughts; would you mind me closing the window?" is the not infrequent remark of a cautious visiter.

It has been amply demonstrated by our medical men of late in teaching bygiene that colds are caused by bad air, deficient ventilation. There is much more danger to health in a badly ventilated than in a draughty room. In this, as in every thing else, our body adapts itself to our habits. If we constantly sit in closed rooms, an open window for once might cause a chill; whereas if we accustom ourselves to a free circulation of air, we shall not readily catch cold.

The custom is most valuable at night, when we are compelled to breathe so many hours in the same apartment. Even with and open door, the oxygen 19 largely exhausted before morning. It is a wise habit to have our bedroom windows a few inches open at the top winter and summer, except in stormy weather or during intense cold such as we endured in February. To those who practice this, a closed bed-room gives a sense of suffocation during the night, and a headache in the morning. In warm summer weather in the country, it is delightful to have both sashes fung together during the night, and early in the morning when we wake our nostrils are regaled with the scent of mignonette or wallflower. and our ears greeted with the distant bleating of lambs or lowing of cattle It is a refinement of one of the free delights of a giney life.

From the housewife's standpoint these advantages are minimised by the damage done to blinds and curtains from the dust that is certain to be blown in. Sometimes, too, a storm of rain may come on unexpectedly, and injure our fresh curtains before we have time to run upstairs and close the windows. She who is anxious that her window drapery should always be in perfect condition and position, and that as little stray dust as possible should find its way into her house, had better keep her win dows religiously souled. The cottages in our neighborhood keep a long circular pad on the junction of the two sashes to prevent the ingress of dust. Undoubtedly no housewife worthy of the name could allow clouds of dust to come in at an open window, even for the sake of fresh air. But country houses, with very few exceptions, are so situated that there is no business, no traffic, perhaps no public road, and consequently very little dust at any time. The worst we have to endure of that nature is the swirling of chaff and bits of straw on to the carpet and furniture if any of our windows should overlook the farmyard. From which considerations it would appear that, of all people, farmers' wives may most safely fling their windows wide, and admit freely air and sunshine to their houses. And, I regret to add, of different clases I have known they are the most careless and prejudiced in this respect-perhaps be cause, as their duties take them a great deal out of doors, they never feel the want of fresh air.

GRETOHEN.

GOOD THOUGHTS CONDENSED.

That which we doubt is right to us it

Make life a ministry of love and it will always be worth living.

Life without laughing is a dreary blank. A good laugh is sunshine in a house.

The great thing in this world is not so much where we stand as in what direction we are moving.

Every human being is intended to have a character of his own, to be what no other is, to do what no other can.

When a man owns himself to have been in error, it is but teling you, in other words, that he is wiser than he was.

Sorrows are visitors that come without an invitation, but complaining minds send a waggon to bring their troubles home in.

Mirth should be the embroidery of the conversation, not the web; and wit the ornament of the mind, not the fur-

There is nothing which marks more decidedly the character of men and of nations than the manner in which they treat women.

It is not how much we have, but how much we enjoy that makes happiness. A little word will heat my little oven. Why then should I murmur because all the woods are not mine.

HOUSEKEEPER.

Manures.

LIMING LAND.

(By L. F. Hausen).

A dressing of lime, whether in the form of the carbonate, plaster, or quick-lime

of the soil. This substance is added with the double object of increasing the crops and stimulating the action of the ingredients of which the soil is com-

Lime often has the effect of altering the character of pasture land, especially when applied to rough grasses, to which it proves harmful by favoring a higher order of vegetable growth.

The results brought about by its influence will be an increase in the crops, grain of better quality and colour, an carlier harvest and sweeter herbage.

Quick or burnt lime when applied to the soil, acts in several ways, both chemically and mechanically, and it may be said to exert a three-fold influence as a fertilizer. It serves as food for the plant, it works up a fund of organic and mineral constituents lying dormant in the ground; by it, also, the texture of heavy clays and, in the opposite way, of light sands, is greatly improved. It is a direct plant food, and all plants must have more or less lime within reach in order to be in a healthy condition and complete their growth, so that land lacking this mineral element cannot be expected to yield a good return until this deficiency is made good. Beides this, time effects another and most important work. In the process of limemaking, water and carbonic acid are driven off by the heat and it becomes a strong alkali, capable of promoting the decomposition of organic matter and humus contained in the soil. The nitrogen in humus is not available as plant food; to become assimilable it must be changed into nitric acid and ammonia; this result is brought about by the bacteria present in the soil, the carbon of the organic matter being at the same time exidised into carbonic acid. These acids usually combine with lime as a base and thus provent, to a considevable extent the potash and other salts from being too quickly washed away. Lime neutralizes acidity and produces changes in some harmful iron compounds found in low-lying and mossy soils. Some crops, such as clover and roots, have the power of making use of lime when potash is not available, so economising the use of the latter salt. Besides aiding nitrification, it breaks up the compounds of inorganic matter which are inert and by combining with certain of the elements of which these are made up, renders them soluble, and so suitable as plant-food. When we add to this its excellent effect in improving the quality of the crop, hastening maturity, destroying insects and keeping in check noxious weeds, we can realize what an imporlant part lime plays. Furthermore, the physical effect of

time in altering the texture of a soil, opening and making friable heavy clays and stiff loam, is well known. An uncoagulated (?) clay is sticky and cannot be reduced to a state of fine mellow tilth, so as to be pervious to moisture and air. A coagulated (?) clay is friable and can be reduced to powder. This desirable result may be affected by frost and by the addition of certain salts, notably those of calcium. While chalk or lime is employed on clay land to diminish its tenacity and facilitate tillage, it is also useful in giving firmness and cohesion to loose and sandy solls.

In recommending dressing with lime, it is not amiss to sound a note of warning in regard its application in unreasonable excess. Like many other good things, it may be easily overwill, if judiciously applied, have an extione. There are disadvantages as well large, it is collent effect in increasing the fertility as benefits attendant on the too free gree.—Ed.

use of lime, and it is to be regarded as a stimulant (1) rather than as a manure. In fact, its continued application without other manures is hable to cause exhaustion of the soil. A too liberal treatment on newly manured land is likely to cause the liberation of a greater amount of the most valuable food elements than the plants can immediately avail themselves of. Thus valuable food ingredients may be lost by being washed into drains or dissipated as ammonia (2).

The amount of lime applied should not be too large, but may vary according to circumstances, a shallow soil not requiring so heavy a dressing as a deep soil; and deep tillage will call for a larger application than shallower cultivation. As a rule, an occasional dressing of one or two tons per nere will be enough. In the case of strong land, as much as five or six tons per acre is sometimes recommended, but, in practice, this quantity is not often anplied, except for land containing much mert organic matter or heavy land, as already stated. A sandy soil or a soil poor in vegetable matter will require a much smaller amount than one rich in organic matter. Drained lands will need a less quantity than undrained lands.

Almost all soils contain lime to a greater or less extent; but the smaller the quantity, the more profitable, as a rule, will be its artificial application. The state in which the lime is present in the soil, is, however an important consideration. If it is present in the condition of gypsum, or in the form of silicate, lime will be of more benefit than if it exists as carbonate.

The composition and texture of the soil will thus have to be taken into consideration in regard to the amount and kind of lime required. Caustic or burnt lime is much more powerful in its action than chalk or marl, and should be used with discrimination, lest the humus of the soil be unduly diminished. The lime made from magnesian lime stone is said to be of less value as a fertilizer (3). It is now the practice to give smaller dressings at more frequent intervals. It may be applied in the spring or in the failreferably the latter-and should not be deeply ploughed, but lightly harrowed, in; by adopting this course much waste is prevented by drainage and its presence retained within range of the plant roots. This tendency to be carried down into the sub-soil ought to make us cautions not to bury it deeply, but to keep it as near the surface of the ground as possible. It matters little whether it be spread in spring or in autumn, but convenience in carting will have to be taken into consideration. Where it is to be employed as slakedlime, it may be laid down in small heaps and slightly covered with sod or soil. This saves re-filling and re-carting. The heaps placed at interval of ten gards will give forty-eight or forty-mine heaps to the acre. Supposing these to contain fifty pounds, we should thus get a dressing of 24 cwt. per acre. By varying the amount, we can easily get the quantity required. This is particularly applicable to arable land.

(1) In England it is called 'mendment, clearly from the Erench "amende. ment," as are clay, compost, etc. Ed.

(2) The Glamorganshire farmers, some 50 years ago, ruined their land by overliming and under-dunging. Dd.

(3) If the percentage of magnesia is large, it is injurious in the highest de-

Except low-lying and old mossy land, It is more advantageous to add lime to pastures and grass land. In the form of compost, which had better be applied; in the autumn, in order that it may sink into the ground and thus be able to stimulate early spring growth. For this Two systems of broaking horses for purpose, the lime may be allowed to slake, or a compost made, in some part of the field. It should be applied direct from the eart, and not formed into small heaps, as is the practice on arable land.

Broad or "frying-pan" shovels are the best implements for filling carts with lime, and spreading it on the land. The spreading must not be done in rain; weather and a calm day is most suitable for this operation. In the case of a slight breeze the direction in liming should be against the wind. In spreading, the lime should be thrown right and left from the middle of the ridge towards the furrows, which will become. after ploughing, the crowns of the future ridges. Care should be taken to spread it as evenly as posible over the surface.

Chalk (carbonate) and marl are also sometimes employed; the latter is a day containing particles of chaik visible in its mass. Both these, it must be remembered, are far less active agents than quick lime, and are chiefly effective in improving the texture of the soll.

The best way to apply lime to grass land is not to add it, alone, but to mix it with earth in the form of a compost, and to top-dress the fields with this, taking care, however, that the mixture be not too weak in lime. The proper proportion is one cubic yard of lime to three cubic yards of earth, well mixed together.

The danger of over-liming has already been alluded to. In this matter the appearance of the crop will be a safe guide. A crop of senut growth and poor color will be benefited by a liberal application of lime. If, on the contrary, growth is too rapid, the color over deep, the ripening slow, or if there is a tendency to the laying of the crop, then the amount of lime should be diminished.

Dr Voeleker, in speaking of the importance of liming poor land before dressing it with dung or other manure, expresses himself as follows in respect of action on soluble phosphates: "The presence of much or little lime in a soil has also a powerful inducate on the changes which soluble phosphates, or manures containing soluble phosphates, undergo in contact with the soil. It is a curious, and apparently anomalous circumstance, that on sandy soils, and on all soils deficient in lime, concentrated superphosphates, rich in soluble phosphate, do not produce nearly so beneficial an effect upon root-crops as upon calcareous soils, or upon soils containing even a moderate proportion of

"When applied to root-crops upon saudy soils greatly deficient in lime, a concentrated superphosphate produces a smaller crop than a manure containing only one-fourth the percentage of soluble phosphate. When this fact was first brought under my notice. I ascribed it him from utter idiotey. to prejudice, or accidental and unobserved circumstances; but direct experiments and an extended personal experience have shown me that there is no mistake about this matter. The true explanation no doubt is that the excess of acid soluble phosphate in a concentrated superphosphate is not precipitated as efficiently in a soil deficient in lime as it is in land containing a good deal of

The Korse.

THE EDUCATION OF THE HORSE.

riding.-Insular vs Continental, or the ordinary English and Irish method as opposed, to the riding school; or manege.—Horse taming not horse breaking.—Superiority of the former, in the writer's opinion, for all horses, except those intended for military use.-Horses broken to harnees without blinkers, much more reliable than others.

The system of procedure, by which exceptionally skilful and fearless riders, in Australia, South America and our own North-West, manage to mount unbroken horses and straight way ride them into a certain sort of subjection, without any preliminary handling, although worthy of unbounded admiration, on account of the wondertul powers of pluck and adhesiveness displayed by these adepts at their art, and most interesting to see, or read about, is not a system of training or breaking horses, worthy of the name, er at all suited to a community where we require at least fairly good manners ior our gees.

Nor, are those rapid methods of handling victous or uncontrollable animals, as practised by different professors of the art from Mr. Barey downwards very permanent in their effects, as far as rendering them thoroughly reliable, afterwards, in the hands of average moderate horsomen. There are some men who say that they can do this, and cure any horse of any kind of vice. Now this is munifestly absurd, and it is a matter of congratulation for us, that there are very few really vicious horse naturally, although there are a good many spoilt ones, or with some defect of temper which prevents them from being as useful as they might be. While for subsequent reasons, I prefer what I have termed the Insular method i. e., that of the best English and Irish breakers, since the practice of riding to hounds in Eugland, became general, I will dispose of the continental or school method first.

Of course the school method, was formerly that of England also, and still is as far as the army is concerned, while on the continent any other system is looked down upon, and despised accordingly. In reading about school methods and talking with army rough riders and riding masters of La Haute Ecole, the first thing that strikes you is the different estimate formed by the different exponents of these two schools of breaking, of the intelligence of the animal, whose colucation is the subject matter of their handl-work. I nover met a school-man, yet, that did not tell me that the Lorse was a very stupid animal, with the one redeeming point of a retentive memory to save

They look upon the horse, as a mere machine, which must not be allowed to do a single thing, however right, of his own free will, and do everything in unswer to certain well defined signals, always to be kept in a state of absolute servitude and subjection. No matter. how he is made, he must be taught to carry his head and neck in a certain

not dare to think for himself on any matter whatsoever. In other words the horse is to be always at the mercy of his rider, which is bad for the horse, sometimes, and with this system, there is certainly not much chance, at any rate in cross-country rkling, of his learning to take care of the bigger fool of the two, as poor Whyte Melville used to say. We, of the cross-country school, like Whyte Melville, and all those who breed and break their own horses, think that although, no doubt, there are some very stupid horses. there are a great many more very intelligent ones. If our horses lived with us in our tent, as the Arab horses do, or In our houses, as do our dogs, I thing that there would be very little dispute about that.

It is a mistake to think that the natucal timidity of a horse is of any advantage to us as far as breaking him is concerned, on the contrary it is the most fortile source of accidents; but intelligence is always most useful. Harking back over the pages of an old volume of "Scrutator," I find the following lines about the points of a hunter, and I think they show, that we can read intelligence in a horse face. "Had I to choose a hunter, said one of the finest horsenien and judges of his day, hy seeing one point only, it should be his head; for I never knew one with a small clean, intelligent face and prominent eves to be bad.

There is one cause for this difference of opinion, which may be easily explained. School-horses including, of course, all cavalry remounts, represent, as a whole, a much less well bred type of animal, than the high class hunters or lacks entrusted to the care of our best English and Irish breakers, and, we all know that the higher bred a horse is the more intelligent he is, and highly hred horses form much larger proportion of horses in England than they do on the continent. They may be more sensitive in disposition; more inclined to resent bar treatment, but they are not inclined to be more bad tempered than lower bred horses, and possess the advantage of better anatomical formation for the free and efficient performunce of any mechanical movement, required in the carrying of a rider.

On the other hand, a more sluggish dis position renders the school-horse more amenable to rigid and irksome discipline and the control of severe bits and other school aids. As a rule, the school men prefer half-breds to thoroughbreds. But the most perfect manners, subjection to school aids, and obedience to the rider, cannot make up for the want of perfection of anatomical mechanism the suppleness of joints, the frictionless working of the perfectly shaped equine machine, and thoroughbred or very well bred horses alone can supply that. The most thoroughly made school-horse of inferior breeding cannot compare for ease of natural motion and paces with the thoroughbred of the right shape that hus never been inside a riding school, and that has learnt his business in the trainer's paddock, on the road, and in the hunting field. The school men will expatiate at great length upon the neressity of teaching a horse to change his leg, etc. I answer that, mounted on a thoroughbred horse of the right shape, I neither feel, nor care when he changes his leg, I know that he will do it at the right time and that it will give me no uncomfortable feel in the saddle. He is a different sort of riding machine

train car that had bumped over a rail. The school men will tell you that no young horse will either hold himself, or trot, in the right manner, unless taught to do so in the school. I have seen lots of unbroken young horses, move off with the most perfect action, the first time they were mounted, and for that matter, gallop and trot in the most perfect manner, before they were ever handled.

If a thoroughbred yearling did not gallop in good form in a paddock, before even he had ever been backed, he would not fetch much of a price at private sale.

But people will say, given a perfect quine machine, that moves perfectly, will it not be still further improved by school discipline and handling? With the single exception of military purposes, I should think not. For all sporting purposes, of course, and even for hacking on the road. I think that there is something to be lost, and nothing to be gained by subjecting a very well bred horse to school discipline.

As a means of making up, by education, as far as possible, for the awkwardness of movement inseparable from ill shaped, less bred animals, the school system is admirable, as far as it goes.It renders serviciable as troopers, a great many horses that, on first inspection, do not look very promising, but it is of no use for an animal well made enough and well bred enough for a hunter, a steeple-chaser or a covert back. Of course for all racing purposes, anything like teaching a horse to move in the over collected form of the school would be fatal to any pretensions to speed, any horse mouthed and bitted according to school methods must necessarily acquire a habit, of galloping round, and fighting in his gallop, to the great-loss of time in getting over the ground.

Under the school method, on the continent especially, a raw 4 year old is put into the school at once, without any preliminary handling except a little lounging on a cavesson; a double bridle is put into his mouth and a man with spurs is put upon his back who proceeds to get to work to get his head, into what he calls the right position, by the usual flexings with bit, and bridoon, aided by the pressure of the feg, and the application of the spur, all of which procedure, it would take much too long to enumerate. There are some advantages of handling a young horse in the school, which are not to be despised. The horse does not shy, because there is nothing for him to shy at, and he does not try to run away, the ground is soft for fully and is convenient in all weathers. A horse will buck, kick or rear. in the school, but does not usually shy or twist round very suddenly. The long school seat is one very well adapted to most of the anties a horse usually indulges in there, with shortish stirrups a man can not sit a bucker or a kicker, on the other hand, a man riding rather long, is very much less able to avoid being thrown, when, a young horse galloping freely along at sight of some object that he does not like, it may be two or three fields off, and not noticed at all by the rider, suddenly sticks out a fore leg, and pivots round it like a top. It is very much worse than any refusal at a fence, as it is quite unexpected, and the olds are always on the horse. The way to sit this, is not to let the horse do it, but "Alignando boms dormitat Homerus," the wariest rider is caught sometimes, just about manner, which we venture to think is from the low bred one, who when he does the time that he thinks his bunil often not the correct one, and he must so, makes you feel, as if you were in a bas became quite confidential and

reliable. Young horses are always ridden on a snattle and without spurs, by our best breakers, and are not asked to go in a double bridle and submit to the arritation of the spur, before they have acquired thoroughly good manners. Even after a school horse has been turned out of the school as thoroughly broken, a lot of work has to be done over again, when ridden on the road, and the behaviour in the school of a horse, is decentive, as far as his behaviour outside of it is concerned. A lady may ride a horse in a school that would be a very unpleasant animal to ride on the road or through the streets of a town, all this preliminary education, and tammarising with strange sights, which is the best one for making him thoroughly safe and reliable, should be done when he is quite young and before he is even ridden, especially in those days of electric cars, and other horse-disturbing machanism all kinds.

To sum up, the best English and Irish breakers aim at teaching the horse manners and giving him a smalle bridle mouth, so that he will go up to his bridle and bead himself in thorough obedience to rein and leg, before pucting a double bridle into his month. Not that there is any objection to the double bridle, if judiciously used. and, of course, as a matter of fact and of fashion, it is a rare thing, in the Et. glish hunting field to see a horse going in anything else. They start with the assumption that the horse is an intelligent animal, and that young horses are as different in their dispositions as children and should be treated accordingly, very often on quite dissimilar systems. They recognize the fact that all horses are not made in the same way, and cannot carry their heads and necks in the same manner, and that it is quite possible for horses to carry their heads and necks in a widely different manner, and still to carry them well; that the natural manner is which a horse carries his head, as long as he is under sufficient control, is the easiest way for him, and should not be interfered with, and they do not require that that control should be excessive. You will see every day, in the hunting field, horses that jump with their heads held low, others with their heads held high, and both jumping re markably well, and with perfect safety. They also consider that a large majo rity of well bred and well made hors es hold themselves naturally in a good position and move in the best form. without any artificial education being required to teach them how to do so. You can see any day a thoroughbred yearling, that has never been handled, galloping in a paddock. In fact if a thoroughbred race horse has not got naturally a good style of going, hand-Eng and breaking will not do much for him. He is broken merely in order to enable him to be ridden and trained. not to teach him how to gallon, that is his natural pace, and the quality of that should come from his breed ing and proper conformation. No true made horse curies himself badly, he couldn't carry himself wrong if he tried As a modern French writer says, I forget his name: "Je ne veux pas d'un Fystème qui prend sur l'impulsion des chevaux." I find that it was the Duc de Nemours condemnation of the Baucher system, or rather the sentence he pronounced upon it, which we think was most perfectly justified. This, too was the error of the Duke of New- (1) Ttemp. Car. I

eastle's system. (1) It is a curious old work, written in French, and interesting 'purpose of speculation, selling to the to those whom you might call anti- Hittites for a profit. In his time, the quaries on horse literature.

THE HORSE OF ANCIENT HISTORY.

Size of the horse - His disposition -Use in war-Eastern horses and their build.

In Europe the flesh of the horse was used for food long before he was domes ticated. The primitive horse was pro hably too small to carry a man on his back for any great distance, this would render him practically useless for wartare, except when harnessed to chariots. Hence the Greeks, Egyptians, Assyrians, Kelts, and natives of India first used him for this purpose. As soon as the improved conditions of domestication increased his size suinciently, he was used as a charger in war. and in the chase. The probability that the primitive horse was small is based on the fact that all the wild races idescribed in the last chapter), from which he was taken, were not more than twelve to fourteen hands high. And also in the fact that bits found in the "bronze" age (very ancient) are hardly large enough for a pony.

In the Bible we find many references to, and some descriptions of the horse. From all these descriptions, as well as those of other ancient writers, we must infer that the horse of that period was much less docile than at present. There can be no doubt that ages of training and working this noble animal have changed his disposition to a great extent, and rendered him much more pliable in the hands of man.

What lover of horses does not remember Job's magnificent description of a war horse of his days:

" Hast thou given the horse strength, " Hast thou clothed his neck with (thunder,

Canst thou make him afraid as a (grasshopper?

"The glory of his nostrils is terrible. " He paweth in the valley, and rejoiceth

dn his strength: "He goeth on to meet the armed men.

"He mocketh at fear and is not af-(frighted;

"Neither turneth he back from the (sword.

"The quiver rattleth against him.

"The glittering spear and the shield, "He swalloweth the ground in fierce-

(ceness and rage : Neither believeth he that it is the

(sound of the trumpet. "He saith among the trumpets Ha : Ha !

He smelleth the buttle afar off. "The thunder of the captains and the ishouting.

1a Bible times, the horse was used for war and the chase almost exclusively: although in Isalah 28, verse 28 his use is mentioned for threshing grain by treading it out. "Bread corn is bruised; breause he will not....bruise it with his horsemen."

The Hebrews did not use the horse until the time of David, but soon after this their use must have been quite common, for, in first "Kings" we read that Solomon had 4,00 charlot horses and 12,000 cavalry horses. These he procured from Egypt, He not only

bought them for his own use, but for the price of a horse was about 150 shekels of sliver. This was also the price of a charlot, and a charlot was a simple vehicle, so horses were comparatively cheap in those days.

The countries around Palestine used the horse more extensively than the Israelites. As stated before, he was introduced into Egypt by the Hyksos or "Shepherd kings," as they were called, "who knew not Joseph," and became abundant. The Assyrians and Ca mainites also used the horse ex tensively about this time. Their ca valry was very formidable and the chargers highly bred, as Assyrian sculpture testifies. They were bred at this time with powerful shoulders, short thick necks and high crests, in order to make them took fierce and terrify the enemy, "The trappings of the As syrian charger were many and complicated. The bridle was commonly placed over the nose, although some used bits. His head was decorated with tassels and bows, and a collar was placed round his neck. This ornament arried a bell, which swung under his throat. Only one saidle has been seen in Assyrian sculpture, so we may infer that they were not commonly used. In place of saddles many of the warriors covered their horses with embroidered trappings. The Assyrian horse was not shod, therefore hoves "as bard as flint" were of great merit, and were probably sought after and bred for.

At this time, two breeds of horses even used: "Sûs" denoted large heavy horses used for chariots, perhaps these were brought from Susa, and hence the name. "Parash" denoted a cavalry horse which was more active and lighter.

According to sculpture found at Persepolis and Babylon, the Persian gray of antiquity was almost equal in bulk to the heaviest draft horses of today. The statue of a Roman horse of the second century B. C. is large and powerful, with the same general shape and appearance at the Assyrian.

Agriculture was the last use to which the horse was put. The earliest suggestion is seen on the "Bayeux tapes try," which was made in 1066, by the wife of William the Conqueror, to com memorate his conquest of England; in it, a horse is drawing a harrow. But this most have been an exception, as oxen were used almost exclusively long after this event.

CHARLES S. MOORE,

Stanbridge East, Que. March 13, 1897.

The Grazier and Breeder.

COW POINTS.

The inquiry addressed by Prof. Spillman last week, on page 135, to Dr. G. M. Twitchel, under the caption, "The Score Card for Cows," was in many respects one of the most valuable bits of dairy reading ever laid before a dairy farmer. We say valuable because of two reasons:

(1) It is extremely rare that the dairy farmer ever hears or reads a discussion like that.

(2) Nothing can be of more value to the dairy farmer, if he is worthy of association with good cows, than to be

ternal signs of a good cow, and the principles which govern in the establishing of those points. There is not a trotting-horse man in the world but what would give big money if he could pick out a trotting horse by external signs. Yet we know that slowly the science of breeding and judging is bringing out lots of men who can "guess mighty close" in that particular.

The same necessity applies in a dairyman's judgment of a good cow. In reading the questions and answers, we felt that Dr. Twitchell's reply, excellent as it was, hardily reached the point of a full explanation as to what is meant by certain of the points named. For instance, why do we call for a dished face in a cow? This is the reason: The dishing of the face is caused by the prominence of the eyes on either side. A large, full eye is one of the several signs of a strong decided ner yous temperament. By a strong nervous temperament, we mean in one thing, a large supply of nerve force. This is one of the most necessary things a cow must have if she does large dairy work and is strongly supported in that work. Another good indication of the nervous temperament is a strong rugged back bone rising above the withers, with the ribs set wide apart. Such a back bone, taken in connection with the appearance of the head and general lean dairy outline and build, also the bearing and action of the cow, is an indication of an extra large marrow which shall furnish an abundant supply of nerve force to the mammary organs of the cow.

In speaking of the "pelvic arch" is meant the strong rise of the back bone between the hips and the setting on of the tail. Turn to the pictures of nine out of ten of the great performing cows that have lived, and it will be seen that they have a pronounced "pelvic arch." This is essentially a dairy point. Heace a cow of that form has not a "straight back from the horns to the setting on of the tail," as is so stupidly set forth in the scale of points of most of our dairy breeds. This "straight back" business comes to us from the Short-horn breeders. It is a beef outline and has no physiological relation to the function and consequent form of the true, well developed dairy cow. Indeed it is a hindrance to such functions. In the pelvis is contained the organs of maternity. Milk breeding and milk giving, as in these modern times we want them in the modern cow, is simply a large capacity for maternity. There the question begins and ends in the modern dairy cow. We want her constructed, shaped, formed and endowed, physically and mentally, for the large maternal work she must do if she is to be of any profit to us, and as an indication to that end we call for a pronounced "pelvic arch."

On the question of the "touch" or "feel" of the skin and hair, it may be well to say that judgment in this particular can not be told in words. It is something like the sense of taste or smell. No one can describe in words the difference between sweet, sour or bitter, or the difference between the smell of a rose and a poppy. The dairy "feel" must be learned by practice. Take dairy cows and beef cows, side by side, and study the difference in the "feel" of the skin and hair. The "touch" is a strong indicator of vigor of condition.

We trust Dr. Twitchell will pardon our "put in" on this discussion. It brought to a study of the points or ex-1 is a broad, and as yet, but little explored

tield, especially by the dairy farmers, who of all others, ought to be deeply interested in its study.

· Hound '

COWS AT GRASS.—In our opinion, and we have had a good deal of experience in the matter, if we had only a small sum to lay out for purchased food or manure, we should prefer spending it on food to give to the milking cows at pasture to laying it out on nitrogen at 18 cents a pound, which is about what it comes to in the "complete fertilisers" now on the market.

A couple of pounds a head each day to cows on grass will make a murvellous difference in the yield of milk, and, as we believe, in its quality, too, and whatever is not thoroughly digested will be available to the grass as manure. And this system, of extra feeding on pasture, has the additional good quality over manure of not requiring the expenditure of labour in spreading.

If we only could see, here and there, throughout the country, a farm on which crops were grown on purpose to be fed-off, "in situ", by sheep; and pastures grazed by cattle, with additional food, such as we have been speaking about, we should soon see an improvement in the general farming of the province, that, at present, seems to be very far off.

IMPORTATION OF AYRSHIRE CATTLE

In a recent number of the "Scottish Farmer" published in Glasgow, Scotland, there appears a picture of seven highly purebred Ayrshire Cattle which have recently been imported, and are now in quarantine at Halifax. The "Scottish Farmer" speaks of them in the most landatory terms, and says that the animals have been secured from the very best milking strains in Scotland. The dam of one of the animals imported "Old Beauty Lass 6894" has maintained a great reputation in Scotland, her milk record being from sixty-six to sixty-eight pounds per day.

Since the World's Commbian Exposition, held in Chicago in 1893, where our Ayrshires took such high rank, there has been an increasing demand to secure Ayrshires from the Province of Quebec, and it is with a view of introducing the best strains of blood from Scotland that this recent importation has been made. The animals were selected by Mr. James Boden, Manager of the Tredomoch Farm, owned by Mr. Robert Reford, at Ste. Anne de Bellevue. Four of the cattle are for Mr. Reford's farm, while two are for Mr. Wm. Wylie, of Howick, and the remaining one for Mr. James Cottingham of Ormstown, the recent winner of the Gold Medal for the best managed farm in the Countles South of the St. Lawrence.

The animals will be released from quarantine about the middle of next month. We are happy to note a steadily increasing demand for pure-bred Ayrshires, and more particularly for those which have a reputation as good milkers.

Swine.

PROFIT IN SWINE

"Dds. Country Gentleman"—Hogs have long filled an important place on our farms, principally as meat producers for family use. Partly owing to

the stringent times, and partly because of the changes which come with the advance of years, the hog is being transferred to the list of money producers. That there will always be a demand for good pork is unquestionable. For economy, both to the buyer and seller, there is no meat which surpasses pork. Its fine flavor and the small ratio of waste in the hog commend it to lovers of meat in spite of the ancient prejudice respecting the swine's itesh.

Western farmers are this year selling pork at \$3.25 per cwt., and claim to be realizing a profit of 100 per cent, on the selling price of their corn. In our section it is selling at \$5 per cwt., and although not raised in so large numbers the hogs are perhaps grown as cheaply as in the West. Hogs grown in large herds are not grown so nearly from the waste products of the farm, garden and dairy as the few kept by the New-York farmer. Their liability to disease at the West is greater, because of the predominance of corn in their diet. There is a prejudice among pork buyers here against western packed pork. This helps the market for the home product, which has this year been well sustain-

I think a larger rate of profit can be shown by a neighbor who raised two March pigs, selling one and packing the other, than any western pork-raiser Having the skim-milk from two good cows, the pigs received little else till fattening time. The litter to which the two pigs belonged came March 24, 1896. One was slaughtered at seven months, dressing 225 lb.; the other dressed, at eight and a half months. 332 lb. Allowing the pigs to have been of about equal weight when the first one was killed, we have a gain of about 21/4 lb. a day on the latter. The whole litter contained seven pigs and the rest were slaughtered at about eight months. averaging about 300 lb. apiece. Here was an average gain of over 1 lb. per day from the time of weaning. At 5 cents per db. for the pork, we have an average of over 10 cents per day for the feed given to the two pigs. There is clearly a good profit in the operation, with grain at its present prices, and would be if grain were much higher. Much of the growth of these pigs must be credited to the cows. At the low price of butter, many cows would make a poor showing when ba-Lincing their accounts, were it not for this side issue. The facts have been given; now for

the lesson to be drawn. In breed, the Chester-White predominated, giving the pigs good bone. The pigs stood well upon legs, looking almost too leggy for promising pigs. Their start in life was excellent, the sow being well fed before and after farrowing. She proved to be a good milker, pushing the pigs from the start. Had the litter been reared together, they probably would not have made so good a showing at the shambles, but being taken by different parties and being given plenty of their natural food, skim-milk, and ancrowded, they advanced about as fast as nature could lay on the flesh.

FEEDING PIGS FOR PROFIT.

EDS. COUNTRY GENTLEMAN.—The majority of feeders of pigs have not caught on to the present method of feeding for the highest market value. Nor have they discovered the best way of marketing their product.

If one should go into a fine grocery lice that this weed had almost disap- prepare the food of the larvae. More

store in any large town or city, and ask for bacon, he would be shown narrow strips of lean meat not more than one and a half inches thick, in which the lean and fat are mixed in thin streaks. And the price of this kind of meat is twenty cents a pound. It used to be more when I used to sell bacon made of pigs under a hundred and fifty pounds dressed and by no means fat, but which were fit for killing any day after they were three months old, without any finishing.

These pigs were fed mostly on clover pasture with the skimmed milk and buter milk, with a little mixed meal of corn and peas and oats grown together, and threshed and ground fine. The pigs were slaughtered and dressed with care to get a clean smooth skin, and the meat was dry-cured and only slightly smoked. As the main business of the farm was fine butter making, the waste milk from tifteen cows fed about twice as many pigs, with good clover pasture and a few ounces of the meal mixed with the milk. The feeding of an animal has everything to do with the quality of the ment, of course allowing something for the kind of pig. as to its habit of growth.

The Berkshire is the model bacon pig, always ready for the knife from three months of age. But at five or six months the meat is in the best condition for curing in this form. The hams and shoulders cared in the same way brought diffeen cents a pound.

I find in a Danish agricultural paper that this is precisely the way the farmers there do with their dairy perk, which sells in the English market at twice the price of the best American meats. We have read something of how they do in Denmark, in their dairy business, and this is one of their improved methods, but the Danes have not the sole monopoly of excellence by any means. But why cannot we do a good deal more of this on this side of the Atlantic and meet the Danes in their good market as well as supply our home trade?

H. S.

Correspondence.

THE OX-EYED DAISY.

To the Editor of

The "Journal of Agriculture."

Nothing perhaps causes the thrifty farmer a greater feeling of annoyance than to see the Ox-Eye, Daisy or Marguerite popping its white nose up in his mendows in the mouth of June. He may fight against this weed for a time, but slowly and surely as it settles into his pastures and along the sides of the fields and perhaps in his less careful neighbor's meadows, it gets the better of time till he almost gives up in despair to make up his mind that all his crops must contain a percentage of marguerites. I had suffered little from this plague until a few years since, when the top dressing of a rather sandy meadow with the manure of a town stable produced a very nice crop of Marguerites. In a year or so, these weeds had increased to such an extent as to make the field well nigh white. In order, at any rate, to prevent the spreading of this weed. I cut the field in the end of June of that year (1894) and before the flowers had seeded. This cutting I repeated at the same time in the following year, and last summer was surprised to no-

peared. At any rate the swing of a scythe here and there throughout the field was quite sufficient to cut all that appeared last year.

This year I have reason to believe will find my meadow free from this obnotions weed.

This proves (does it not?) either that the Marguerite is a blennial, and not a perennial, as it has often been stated to be, or, that this cutting of the weed before it has ripenned, will kill it. What is more to the point, don't these facts show that this very trouble-some weed may be got rid up by treating it in the manner I have described?

By my observation the seed of the Marguerite in grass land does not ripen till after the first of July. To cut this grass by that date is no very great loss to a farmer, and I would ask some of your readers, who find that their fields in June are white where they should be green, to try the method. I have indicated in order to attempt to get rid of a weed which causes them so much loss every year.

WILLIAM MORRIS. Sherbrooke, 10 May 1897.

The Apiary.

(Continued.)

In our last, we left the Quéen, triumphing in her victory over her rival, and reigning over the hive in undisputed authority. Lot us now follow her into the sacred limits of the realms of love.

From three to five days after her eruption from her prison-cell, the Queenbee takes her bridal flight, and her nuptials, with a drone, are celebrated in the upper air, from 20 to 25 feet from the ground. The Queen, of course, survives, but the unfortunate drone, her mate, perishes as soon as the couple return to the hive, and this by the action of his cruel bride. The Queen is now no longer in need of a husband, as she is in a condition to bring forth progeny to her life's end.

THE WORKER-BEE.

The workers are the smallest inhabitants of a bee-hive, and complise the bulk of the population. A good swarm ought to contain at least 20.000; and in large hives, strong colonies, which are not reduced by swarming, frequently number four or five times as many during the height of the breeding season.



Fig. 23.

Their functions are varied. "The young bees" work inside the hive, prepare and distribute the food to the larvae, take care of the queen, by brushing her with their tongue, nurse her, maintain the heat of the hive, or renew the air and evaporate the newlygathered honey by ventilating. They clean the hive of dirt or dôbr.s. close up all the cracks, and secrete the greater part of the wax which is produced in the hive.

"The old bees" may, if necessary, do a part of the same work; but, as we have seen, odd age renders some unfit to

alert than the young bees, they do the propolls to cement the cracks. *

'Huber speaks of two kinds of workers. "One of these is, in general, destined honey; the other immediately imparts sort, subject in the period of youth. Its what it has collected, to its companions; its abdomen undergoes no sensible change, or it retains only the honey necessary for its own subsistence. The particular function of the bees of this kind is to take care of the young, for they are not charged with provisioning the hive. In opposition to the waxworkers, we shall call them small bees, Fig. 26.- Colled in the cell. (Magnified, or nurses."

There are none but "gentlemen" of lelsure in the commonwealth of bees, the mother who fills it must daily superintend the proper deposition of thou sands of eggs.



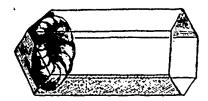
Fig. 24.—The egg in the cell. (Magniticd.)

"The eggs of bees are of a lengthened, oval shape with a slight curvature, and of a bluish white color; being besmeared, at the time of laying, with a glutmous substance, they adhere to the bases of the cells, and remain unchanged in! figure or situation for three or four and somewhat concave."-(" Bevan on days; they are then hatched, the bot- the Honey-Bee.") tom of each cell presenting to view a small white worm."- (Bevan.)

jelly, thought to be prepared or secret give air to the inclosed insect. From ted by the upper pair of glands of the its texture and shape it is easily thrust in the nurses. This milky feed is a it consisted wholly of wax, the insect

"The mixture of honey and pollen outside work, gather honey, pollen and given at the end of the nursing, is easily water for the use of the family, and detected by its color, which is yellower, on account of the pallen, and can be Cheshire teaches us that it does not seen through the skin c, of the larva." (Dubint)

"The larva, or grub, grows apace, but for the elaboration of wax, and its size not without experiencing a difficulty to is considerably calarged whea full of which the human family is, in some



From Sartori and Rauschenfels.)

cont is inelastic and dies not grow but assuredly there are no such "ladies," with the wearer, so that is soon, fitting whether of high or low degree. The badly, has to be thrown off; but, hapqueen herself has her full share of duties. pily in the case of the larva a new and the royal office being no sinecure, when larger one has already been formed beneath it, and the discarded garment, more delicate than gossamer, is pushed to the bottom of the cell."-(Cheshire.)

"The nursing-bees now seal over the cell with a light brown cover externally more or less convex (the cap of a drone-cell being more cenvex than that of a worker), and thus differing from that of a honey-cell, which is paler

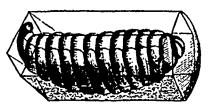


Fig. 27. (?) Stretched in the cell. (Magnified.)

The cap of the brood-cell is made not of pure wax, but of a mixture of bee-For the first three days after their bread and wax; and appears under the hatching, these worms are fed with a microscope to be full of fine holes, to worker-bees (39), which are very large off by the bee when mature, whereas if

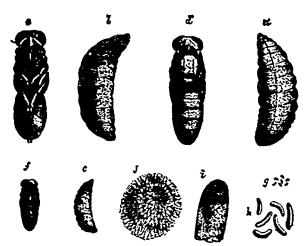


Fig. 25.-Brood in all stages. (From Girard.)

natural size; g, eggs, natural size; h. magnified; i, egg, showing micropyle magnified; j, micropyle, magnified.

of honey and pollen.

a, b, magnified larvae; c, the same na-tural size; d, e, magnified nymph; f,

whitish, transparent fluid, and is distri- would either perish for lack of air, or buted to the larvae, as it is recoled. After be unable to force its way into the four or perhaps five days, the linea is world. Both the material and shape of too large for the bottom of the cell, the lids which close the honey-c. lis are where it was coiled up, to use the lan different: they are of pure wax, and guage of Swammerdam, like a dog when are slightly concave, the better to regoing to sleep; and stretches itself till sist the pressure of their contents. The it occupies the whole length of the cell, bees sometimes neglect to cap the cells lying on its back. Its food at this time, of some of the brood, and some persons is changed for a semi-digested mixture, have thought that this brood was diseased, but it hatches all the same 1897.

The larva is no sooner perfectly inclosed, than it begins to spin a cocoon after the manuer of the silk-worm, and encase the insect, but is only at the mouth of the cell, "and in no case extends far down the sides."

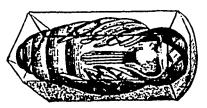


Fig. 28.-The transformation in the sealed cell. (Magnified.)

When it has undergone this change, it has usually borne the name of nymph," or "pupa." It has now attained its full growth, and the large amount of nutriment which it has taken serves as a store for developing the perfect insect.

"The "working-bee nymph" spins its roccon in thirty-six hours. After passing about three days in this state of proparation for a new existence, it gradually undergoes so great a change as not to wear a vestige of its previous form." taine, M.P.

Co-operative Society of the Farmers Clubs of the County of Chambly.

PLOUGHING MATCH AT ST. HUBBERT.

We reproduce in to-day's issue the results of this competition already published in our number for January last, adding to them, however, in certain respects in accordance with information received since their publication:

The ploughing-match under the auspices of the co-operative Society of the Farmer's club of the county of Olaumbly was held at St. Hubert, on the 14th. of October last.

Judges: Messrs. J. B. Deslauriers, Pointe-Chaire; Joseph Brossard, Laprairie; B. Lefebvre, Laprairie.

The contest was held on the grounds of M. Napoléon Désilières, of Saint-Hubert.

Secretary, M. Alfred Charron.

SPECIAL OLASS.

1st prize awarded to Francis Toupla, Chambly, \$10.00, given by the Hon. C. A. Geoffrion, minister without porfolio. 2nd prize to Israel Huot, Chambly, \$5.00, given by Mr. Raymond Profon-

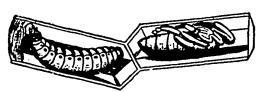


Fig. 29.-Spinning of the cocoon and transformation into nymph. (Magnified. From Sartori and Rauschenfels.)

Farmers' Clubs, &c.

NOTICE.

To the Presidents and Secretaries of Agricultural Societies and Farmers' Clubs.

We would remind the presidents and secretaries of all farmers' clubs and agricultural societies that subscriptions to the "Journal of Agriculture," expire with the June number.

In order to avoid delays in the distribution of the Journal during the year which begins with the month of July next, these gentlemen are earnesdy requested to transmit at the beginning of May, addressed to the secretary of the Council of Agriculture, Quebec, a list of those members who have paid their subscriptions for 1897. The list of names should be drawn up in alphabetical order and the edition-whether French or English-of the journal which each member wishes to receive, indicated by the letters A or F.

NOTICE.

To Agricultural Societies and Farmers' Clubs.

The secretaries are urgently requested to send in, as soon as possible, to the Department of Agriculture, Quebec:

- 1. Reports of the last elections of mem bers.
- 2. All accounts.
- 3. The Programmes of operations for

3rd prize to Damase Charron, Cham bly, 300 lbs. of Victor chemical manure, given by friends in the Town of Lougueuil.

FIRST OLASS.

Ploughmen 21 years and over:

1st prize, Joseph Mercil, Chambiy, an iron plough given by the Richelieu and Ontario Navigation Co.

2nd, Isaac Forget, Chambly, horse-hoe, given by Mr. W. Ewing, seedsman, Montreal.

3rd. Alphonso Permult, St. Bruno, spring-harrow, given by Messrs. Moody and Sons. Montreal.

4th, Theophile Mongeau, St. Bruno, 400 lbs. chemical manures, given by friends in the Town of Longueuil.

5th, Auguste Dulude, St. Hubert, ploughman to M. Aimé Guertin, milkcan, given by Ernest Archambault, Montreal.

6th, Staniskas Boisy, St. Bruno, pipe, given by Ovila Lassier, Montreal, and \$2.00 by the agricultural society of the

county.
7th, Moise Vincent, St. Hubert, \$3.00, given by the Hon, C. A. Geoffrion.

8th, Charles Trudeau, Chambly, \$2.09 given by R. Préfontaine, M.P.

SECOND CLASS.

Ploughmen who have never won a prize at any ploughing matches:

1st prize, Théophile Brosseau, St. Hubert, a fine set of harness, given by Dansereau, Gauthier and Lynch, Mont-

2nd, Napoléon Raymond, Chambly, spring-harrow, given by R. J. Latimer, Montreal.

3rd, Joseph Lacoste, ploughman to M. Elle Ste. Marie St. Hubert, a throughbred Shropshire owe, given by D. Parizeau, M.P.P., Boucherville.

(To be continued)

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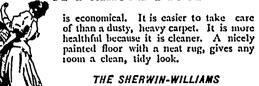
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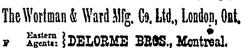
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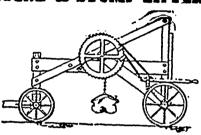
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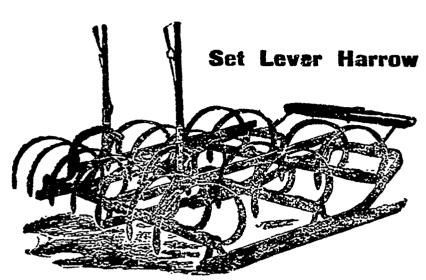
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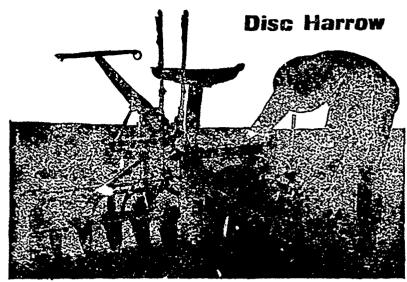


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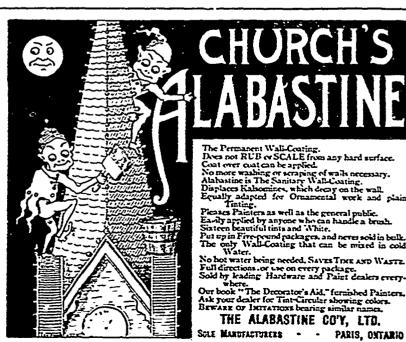
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