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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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THE

Journal of Agriculture and Horticulture

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The Farm.

NOTES BY THE WAY.

"Rotations."—We insert, as a confirmation of what we have often said as to the alterations observable in the four-course rotation as practised in England, a passage from one of Mr. Wrightson's weekly contributions to the Agricultural Gazette; on light land, pease would be substituted for beans, in the 3rd limb of the second modification, and trefoil for clover in the 3rd limb of the first modification :

ROTATIONS OF CROPS.

One of the means suggested for helping farmers in their difficulty has been an alteration in the system of cropping. The The four-course was said to be doomed, and some other courses were submitted.

On further examination, however, it seemed that the four-course rotation was really still there in a modified form. The four-course rotation does not exist by virtue of its being four years in duration. Its essence is not in its length, but in its principle of alternation between corn and fodder. It is difficult to eradicate the four-course rotation, because, crop land as you may, it is always there. The Norfolk or four-course rotation is a wonderful and highly scientific system of cropping land which it is very hard to beat. Essentially it consists in two classes of crops—corn and fodder, which are alternated. First corn, and then fodder; first food for man, and then food for beast; first an ex-

hausting crop, and then a renovating one. It makes little matter what crop you employ so long as the principle is maintained. You may take roots, barley, clover, wheat, as an example of the four-course system; but it is not altered, except in detail, if you take rape, wheat, clover, oats; neither is it destroyed if you choose to take potatoes instead of roots, and peas instead of clover. It is still a four-course rotation which harmonises well with the more ordinary course of roots, barley, clover, wheat. The four-course is capable of a great number of modifications, each of which readily allows of a return to the original ideal course. The following are some of the modifications of this wonderfully plastic principle of cropping land:—

The original form: (1) Roots, (2) barley, (3) clover, (4) wheat.

First modification: (1) Roots, (2) wheat, (3) clover, (4) wheat.

Second modification: (1) Rape, kale, or cabbage; (2) wheat, (3) beans, (4) wheat.

Third modification: (1) Fodder crop, followed by roots; (2) barley, (3) clover, (4) oats.

"Tobacco-planter."—M. F. X. Guertin, of St-Théodore d'Acton, wants to buy a tobacco-planter. Would any one of our readers, who knows of a maker of these implements, be good enough to send his address to M. Guertin, as we cannot remember the maker's name?

"Bacon-hogs."—Mr. Whaley, of Durham centre, Ont., has evidently formed very sound ideas as to the proper way of breeding and treating bacon-hogs.

After laying much stress on the necessity of cleanliness and plenty of light in the "home of the hog," meaning thereby pens or sties, he goes on to say that, as regards thoroughbreds, Tamworths and Yorkshires are the only two breeds that give satisfaction; but that he has been successful with a cross of Berkshires and Tamworths. What was wanted was a long straightbacked pig, deep in the sides, short in the ham, and narrow over the shoulders, but why he recommends the food to be "of good bone-producing quality," we do not understand. To castrate pigs at six weeks old is right enough, and the eight weeks he allows to elapse between farrowing and weaning is correct; but one speaker at the Institute talks of not weaning till the pigs are ten weeks old, which seems to us to be hard on the sow if she is to bear two litters a year.

Mr. Whaley feeds his growing pigs on shorts, some corn, and mangels, cooking the food, in winter, twice a day! As they are advancing, the corn is increased, "and you will have at about seven months old a bacon-hog, weighing from 180 to 200 lbs., according to the breed." Besides increasing the corn, he adds a good dose of pease to the ration. Nothing like pulse for making lean, firm meat.

The balance sheet of Mr. Whaley's herd of pigs is as follows:

Stock on hand December 31st, 1898	$ 395 50
Sold 18,905 lb. dork at 4 21-100	795 89
Sold fat sows	57 63
	$1,249 02

Food consumed during the year:

Shorts, 20 tons and 1,472 lb. at $16.38 per ton	$ 339 45
Corn, 5 tons and 1,957 lb. at $13.90 per ton	82 80
Mixed chop, 4 tons and 40 lb. at $15.25 per ton	61 84
Bran, 2 tons and 436 lb. at $14 per ton	31 68
Peas, 15 bushels	7 50
Mangels, 800 bushels at 5c. per bushel	40 00
Stock on hand December 31st, 1899	347 00
Balance for care of hogs	338 75
	$1,249 02

I also used the whey from about 87,000 pounds of milk sent to the factory, and as an offset we had 60 loads of first-class manure.

"Root-crops."—A good deal of difference exists among Ontario farmers as to the best way of preparing the land for root-crops. Mr. Rennie, of Milliken, very sensibly sows roots after oats, the last crop in the rotation, and therefore when the land is in the poorest condition. He probably farms heavy land, as he ploughs-in the manure in the fall, though why he should drill up his land in the spring, to sow on that raised surface, we do not see, unless the soil is very wet. In singling, the rows being 30 inches apart, he sets out his mangels at least 24 inches in the rows, which is a perfect absurdity; two feet between the rows and a foot between the plants, would give o far heavier crop and, probably, of a better quality. At the distances, Mr. Rennie uses, there would be 8,712 plants on an acre; at the same distance between the rows and the plants set out a foot in the rows, there would be just double as many, i.e., 17,424.

If the dung is ploughed-in during the fall, as it should be on heavy land, nothing is gained, except, as we said before, on wet land, by sowing on the raised drill, particularly in our hot summers.

Mr. Rennie does not like making drills for potatoes with the double-mould-board plough; he thinks it packs the soil with its long sole. Possibly it may, but if at the first or second time of cultivating, the horse-hoe is let down as deep as it will go, the disturbance it creates will break up any "packing" caused by the d. m. b. plough. Horse-hoe deeply the first or second time; afterwards, as you please.

THE IMPROVEMENT OF STOCK.

(Official circular).

Department of Agriculture.

Quebec, February 1st, 1901.

Sir,

I beg to draw your special attention to a resolution of the Council of Agriculture, adopted at its sessions of the 23rd and 24th of January last, and intended to aid the Agricultural Associations in the improvement of farm-stock in this province.

In future, the agricultural Societies will be empowered, when they think it advisable not to hold an exhibition, to devote the grant they receive from the government, either to the purchase of breeding animals—stallions, bulls, etc.,—or to making grants in aid of their keep to the proprietors of stallions, etc., in which cases, the directors of the said societies may return to the members, in artificial manures or grass-seeds, the whole amount of their subscriptions. The agricultural societies will thus have every needful facility of enlisting additional members.

By thus enlarging the sphere of action of our agricultural societies, the Council of Agriculture has only fulfilled the desires so vehemently manifested, and the wants that the whole farming class would, without exception, glad aid in satisfying.

No one dreams of denying the importance of the improvement of stock, and even if there is still a difference of opinion as to the best means of gaining that end, there is no dispute as to the merits of the problem to be solved.

Particular attention should be paid by the agricultural societies to the breeding of "the horse." Of late, England has been buying an enormous number of horses, but, unfortunately, while we were selling the English many a cargo of hay, meat, and canned fruits, we could only furnish them with a very few specimens of the stamp of horse required. Hardly 3 per cent of the horses bought by England came from the Dominion, although Canada is considered to be a country well adapted to the breeding and rearing of horses.

Thus, we lost a favourable opportunity of realising great profits, not because we had not plenty of horses, but solely because we had not the stamp of horse required.

Here, then, in the improved breeding of good horses for the remounts of the army, and, indeed, for trade in general, lies a future for the farming population of the country.

If I have found it my duty to draw, very earnestly, your attention to the resolution of the Council of Agriculture, it is because I am convinced that, if properly followed out, it will be of great service to farmers in general, and that you yourselves will unite your efforts with those of your fellow citizens who take an interest in the development and progress of agriculture, the basis of our national welfare.

The new regulations of the Council, as to the grants to the proprietors of stallions, etc., and for the purchase of male breeding animals, will be sent to you very shortly.

I have the honour to be
Your faithful servant,
F. G. MIVILLE DECHENE,
Commissioner of Agriculture.

Kirkdale, Que., Feb. 15th., 1901.

To the Editor of the "Journal of Agriculture."

Mr. Editor,

I should like through the columns of your Journal some information in regard to growing rape. I have a flock of 35 ewes which were mated with a pedigree Leicester ram, so I expect a pretty good yield of lambs. They will be along from the first of March until the first of May, and I want to get them, the lambs, off early in August, if possible. I plowed a five acre field of old pasture, which had been in pasture 5 years, 6 inches deep early last fall, and it is adjoining my pasture. It is a nice piece of land, good soil, high and dry, and I have the manure of 20 head of cattle to put on it. Now I want to know if rape would be the best crop for me to grow; also when to sow, quantity of seed, etc., etc. I have a Massey-Harris Hoe-drill so can drill it or broad-cast it.

We are having a genuine storm, but I trust it will soon cease, as our roads are getting almost impassible.

I remain yours respectfully,
HERBERT PYE.

Kirkdale, Que.

Note by the Editor.—We replied to the above enquiries by letter, as we have so often described, in this paper, the proper way of growing and consuming the rape-crop that it would be waste of space to go all over it again here. But we must be allowed to say that we rather grudge giving rape to hogs, as our correspondent M. Mortureux advises. The rape is peculiarly suited to sheep, as it is in perfection, if properly treated, from the 1st July to the end of October, just the time when all other sheep-keep is at its worst.

As to the dung Mr. Pye speaks of, we should rather advise him to employ it on some other crop, as a few bushels of bone-meal,—say, 10 to the acre—would manure land for rape quite sufficiently after the 5 years of pasture. The perfect dressing for rape would be: 8 bushels of bone-meal and 100 lbs. of sulphate of ammonia, or 120 lbs. of nitrate of soda. The bone-meal and sulphate should be broad-casted and harrowed in before sowing.

ALFALFA OR LUCERNE GROWING.

Probably the plant doing most to revolutionize agriculture in the central west is alfalfa, and in his latest publication, "Forage and Fodders," Secretary F. D. Coburn, of the Kansas Department of Agriculture, presents a most complete and comprehensive article on this subject. The author is Prof. Geo. L. Clothier, a most careful student of alfalfa, and for many years identified with the Kansas Agricultural College. He and the general interest in alfalfa have grown up together, and as Kansas has been and is the great alfalfa experiment station of the world, a recital of his observations and experiences should prove of inestimable value to all in any wise interested in this wonderful plant.

Pertinent excerpts from the article are presented herewith:

The preparation of the soil should rightly begin two or three years before the time of seeding alfalfa. If the land is so weedy that it cannot be cleaned by cultivation, it should be fallowed for one season prior

to the seeding. If it is desirable to subsoil the land, this should be done a year before seeding, to a depth of 15 to 20 inches, and may be followed either by fallow or a cultivated crop. Time enough should intervene between the subsoiling and the seeding to allow the soil to settle, and to store a bountiful supply of moisture.

The seed-bed should be as fine as an onion-bed, and the subsurface be rather firm and well supplied with moisture. If the soil is deficient in humus, a liberal coating of barn-yard manure plowed under at the time of subsoiling will add greatly to its physical condition, and thus help to start the young plants. If the soil is very sandy, the manure will be of great value in preventing the sand from blowing and in conserving moisture. A very sandy soil is not benefitted by deep plowing or subsoiling. If the soil is heavy, and it is not practicable to subsoil, it should be plowed to a depth of eight or ten inches several months prior to seeding. If the land is allowed to lie fallow after this treatment, or has been fall-plowed, it should be thoroughly disked every three weeks during the summer or autumn, as the case may be, to keep a dust mulch on the surface and prevent evaporation.

The time of seeding is of great importance. This should be determined more by the absence of unfavorable conditions than by the season. Alfalfa has been successfully sown in Kansas in every month from March to September. Where the ground is not weedy, spring seeding has been practised with success. The cold rains of spring, however, when excessive, sometimes cause the young plants to rot off, as would be the case with the adult plant when submerged for two or three days.

The quantity of seed to sow per acre is a question of considerable importance also. The majority of successful growers advice twenty to thirty pounds. If the seed were universally good, and the ground always well prepared, this would be grossly extravagant. A pound of alfalfa seed contains about 210,000 seeds. If ninety per cent of them germinate, twenty pounds per acre would give 3,780,000 plants, or eighty-eight per square foot. After nine-tenths of the young plants have perished from crowding or accidents, we would still have an ample stand. From these facts one can readily find the reasons for difference of opinion among good farmers as to the quantity of seed to sow. As low as eight to ten pounds per acre have frequently been used with success. (1)

The quality of the seed is another very important factor. Good germinable seed should always be used. The percentage of germinability should be ascertained by a test before sowing. This is easily obtained as follows: Count out 100 seeds and place between two pieces of muslin. Invert a small dish in a larger vessel and pour water around it. Place the muslin with seeds on the inverted dish. Let one end of the muslin hang down into the water. Saturate muslin and seeds before putting them into the germinator and set the whole in a warm place. The sprouted seeds should be counted and discarded at intervals of two or three days until all have germinated that will do so. The number germinated will give the per cent of germinability. This ought not to be less than seventy-five per cent.

The color of fresh alfalfa seed is a greenish orange-yellow. As it grows older it all slowly turns to a yellowish-brown color.

Alfalfa may be seeded broadcast or in drills. It is preferable to seed with a drill having a press-wheel attachment, because the depth of planting can be better regulated. The seed should be covered about one inch in depth, unless the surface be very dry, when a somewhat greater depth is admissible. A good method to secure a better distribution of plants is to sow ten pounds of seed, running the drill in one direction across the field, and then cross-drill with the other ten pounds. If the drill has no grass-seeder attachment, the seed should be mixed with about three times its weight of coarse corn meal. When

(1) Eighteen to 20 lbs. ED.

intended for a seed-crop, alfalfa should be sown thinly. Thick sowing improves the quality of the hay; but the plant has wonderful ability to adapt itself to either thick or thin seeding. One good, stout, healthy crown has been known to produce 360 stems at one cutting. When seeding broadcast, the seed should be covered with a light smoothing harrow or with a brush drag. The majority of farmers seem to prefer broadcasting, presumably because they have less difficulty in getting the plants covered shallow enough than with a drill. The majority of grain-drills are not properly manufactured to admit of the nicety of adjustment necessary in seeding grass seeds.

After the alfalfa has been sown in the spring, it will be necessary to run a mowing-machine over the ground two or three times during the summer to keep down the weeds. The sickle-bar should be set high, so as to injure the small young plants as little as possible. If the vegetable debris is so abundant that it promises to smother the young alfalfa, it should be raked up and removed.

In harvesting, mow down as much of the crop at once as can be handled in one day. Let it wilt in the swaths and then rake it into windrows to cure. If the weather is fine, it can be stacked from the windrow by using a sweep rake and stacker. If the weather is threatening, bunch the windrows and cock the bunches to allow it to finish curing. It should be put into the stack with just as little handling as possible. To avoid molding, I have advised farmers to store alternate layers of dry straw and fresh alfalfa hay together in the barn or stack. The straw need not form more than about one-fourth of the total weight. I think this method especially applicable to the first crop in localities where old straw stacks can be easily acquired.

When possible, alfalfa should be stored under a roof, as it does not turn rain well. A cheap hay shed can be built by setting telegraph poles in the ground, braced by two-by-sixes, and putting a good shingle roof on the structure. The sides should be left open and the hay stacked under this shed in ricks. A stacker of some sort or other should be used, as it does not pay to hire men to handle the hay with a fork. They waste too much by shaking off the leaves, which are considerably better to feed than wheat bran, pound for pound. Where a roof cannot be had, the hay should be stacked in high, narrow ricks and covered with long slough grass. (1)

Alfalfa should be cured and stacked, if possible, without being rained upon. No other crop is so easily injured by rain. Alfalfa hay rained upon is worth about half what it would be were it unexposed.

Harvesting alfalfa at the right time and in the right manner very largely determines its feeding value. The majority of farmers wait too long before starting the mowing-machine. Alfalfa should be cut for hay when one-fourth to one-half of the blossoms have opened. When let stand longer, many of the leaves fall off and are wasted. Mowing early stimulates the growth of the following crop. Allowing it to go to seed seemingly exhausts the plant for that season. (2)

Alfalfa fed green, either as a pasture or as a soiling crop, has few equals in its nutritive value. In localities where there is no difficulty in getting a stand, the cheapest way to feed it is probably to pasture it. It should never be pastured until the plants are more than a year old. Owing to their liability to hoven or bloat, it is always risky to pasture cattle or sheep upon alfalfa. Before turning animals liable to bloat upon the alfalfa give them all they will eat of some other food. Death from bloat is often very sudden.

(1) Can't they thatch stacks in the States? ED.

(2) Lucerne, is emphatically, a green fodder-crop ED.

GENIUS OF LABOUR

There is on exhibition in the window of the new Star building, on St. James St., a magnificent bronze statue about three feet high. The workmanship is of the finest. The piece contains three figures. The principal one is that of an able bodied man with the implements and productions of labour at his side. Above and overshadowing him stands his inspiring genius. In

her right hand she carries a flaming torch, and with her left she points to future successes. These and the struggling Cupid constitute his inspiration to greater achievement. This work of art is authorized by the Canadian Commission to accompany and commemorate the Grand Prize awarded to Massey Harris Co., Ltd., at the Paris Exposition, 1900.

CLOVER.

By A McNeil, Walkerville, Ont.

If the farmer were to choose an emblematic flower, nothing could be more suitable than clover. It is suggestive of pure air and sunshine and all the pleasures of outdoor life, delighting the eye with its beauty, exhaling fragrance at every stage of its existence, as well as contributing most liberally to the material necessities of mankind. To paraphrase Sir John Falstaff, " It is not only profitable in itself, but is the cause of there being profit in other crops."

As a fodder, clover is yet much undervalued. A ton of clover hay contains 140 pounds of ash and 300 pounds of protein matter, while the same amountof timothy has only 90 pounds of ash and 180 pounds of protein matter. From this it will be seen that clover is much richer in the expensive nutritive elements, has a larger percentage of bone-making material, and is more nearly a balanced ration than timothy. It is also much more palatable, and, when properly cured and fed, quite as healthful. For milk cows, fattening animals, sheep and working horses, it is indeed preferable to any other fodder, and even the swine-breeder and poultryman can use large quantities of it most profitably.

CLOVER AS A FERTILIZER.

Its value as a fertilizer is more generally recognized. It is a common saying among farmers that anything can be grown on a good clover sod. It has the power, in common with other leguminous plants, of appropriating the free nitrogen of the air, and thus adding absolutely to the plant food of the soil. This is a most important function, indeed, as nitrogen is the most

expensive element of plant food. Nevertheless, the work which clover does in appropriating plant foods at depths not attainable by common plants, and in solutions too weak for their sustenance, is even more important. Its very large expansion of leaf surface enables it to evaporate an immense quantity of water, so that it will live and thrive when the proportion of mineral matter is very small compared with the water which holds it in solution. These elements are stored up in a condensed form in the large tap roots as well as in leaf and stem, so that they can be used by surface-feeding plants.

IT DRAWS ITS FOOD FROM THE SUBSOIL.

Another consideration not to be lost sight of is that a large part of this plant food is taken from depths never reached by ordinary plants, thus tapping a source of wealth that would not be available without its aid. It is often remarked by those interested in the sale of commercial fertilizers that clover adds no mineral constituents to the soil. Practically it does. The only part of the soil of use with ordinary crops is the upper foot. Anything added to this is a direct addition to the fertility of the workable soil. The farmer has his choice of paying good money for fertilizers or drawing them from the subsoil by means of clover which will yield a profit in the form of fodder while doing this grand work. But clover adds another and most essential element to the soil in the form of humus, and here again we must note how admirably clover is adapted to the work in hand. The same amount of humus could be put upon the soil in a few loads of stable manure, but the results would be very different. The clover roots permeate the soil in all directions, and in decaying leave the humus most thoroughly mixed with the soil. To have as much humus from any other source as advantageously placed would require a large expenditure of labor, if it was possible to do the work at all, so that clover may rank as a labor-saving device. Again, the roots permeating the subsoil assist drainage very materially.

MAKE THE SEED-BED FINE.

So numerous and valuable are the virtues of clover that every effort should be made to meet the requirements of its growth. The seed is small, and requires a corresponding fineness, in the soil of the seed-bed. It will not grow readily in a soil deficient in humus, and a good dressing of land plaster or air-slacked lime will always pay. Sometimes, even after the seed has germinated well, the plants will die during the summer. This is often the result of an improper preparation of the soil or want of underdraining, usually both causes combined. (1) Not only should the seed-bed be very fine, but the connection between the surface soil and the subsoil should be very intimate, so that after the spring rains, which usually afford sufficient moisture to start the clover into vigorous growth and mature the crop with which it was sown, have ceased, subsoil moisture may readily rise to the roots of the young plants and carry it through the comparatively rainless months of summer and early autumn. It is difficult to get these conditions with spring ploughing. Corn or root ground that has been well worked for these crops, stirred to a depth of three or four inches the following spring with the disk or other cultivator, but not ploughed, and seeded to clover with oats or barley gives the best results. Sow ten or twelve pounds to the acre. (2) There is no advantage in sowing grass seeds with the clover except in special cases.

"Farming."

(1) But usually from too frequent repetition of the crop on the same land. ED. J. OF AG.

(2) Fourteen pounds to the imp. acre is not too much. ED. J. OF AG.

THE CEREAL HARVEST OF 1900.

Now that the Irish statistics as to the yield of crops are issued, we have the totals of the three principal cereals for the United Kingdom, excepting the small islands, which are never included in the produce statistics. Wheat comes out at 54,322,093 bushels, compared with 67,260,569 for 1899, the yield per acre being 28.61 bushels, against 32.08 for 1899 and 30.27 as the average for the ten years ending with 1899. The corresponding figures for barley are 68,540,292 bushels, against 74,525, 484, and 31.67 bushels per acre, against 34.64 for 1899, and a ten years' average of 33.86. Oats are estimated at 165,137,200 bushels, against 166,139,840, and 39.97 bushels per acre, against 40.57 for 1899 and 40.04 as the ten years' average.

GROWING RAPE.

Ed. "Hoard's Dairyman" : — Please tell me something about growing rape. Will it grow in this country ? When to plant ? How to plant and cultivate ?

H. C. M.

Americus, Ga.

We quote from Prof. Henry the following account of the rape plant :

Those unfamiliar with rape can best gain an idea of how it looks and what sort of a feeding substance it is by remembering that forage rape resembles a rutabaga turnip run to leaf instead of forming any enlarged root stalk. Nature has arranged that during the first season of growth the nutriment is stored in the leaves ; during the second year in mild climates where the plants survive the winter, its nutriment passes out of the leaves and up into the seed pods, where seeds are formed.

Rape is a hardy plant and can be sown any time from very early spring until after harvest, according to the wants of the stockman. To get the largest and most nutritious crops, it should be sown in drills and cultivated the same as a root crop—with this important exception, however, no thinning in required. Where drilled, sow from two to three pounds of seed per acre. Rape may also be sown broadcast upon well prepared land, in which case it should be covered lightly with a fine tooth drag or a brush harrow. When broadcasted, from four to five pounds of seed should be used per acre.

Some farmers have received satisfactory returns by sowing rape seed on a field planted with oats or barley. In this case the best method of procedure is as follows : A week or ten days after the oats or barley have been sown, and just after the young plants have shown above the surface of the soil, sow two or three pounds of rape seed per acre ; harrow this in with a light, fine tooth drag. Covering the seed in this manner does not injure the young oat or barley plants, but is a help rather than otherwise. By sowing later than the oat or barley seeding, the young rape plants are held in check and do not make much growth until after the main crop is harvested. Then having the benefits of full sunshine and all available moisture, the young plants spring forth rapidly and soon furnish a large amount of feed. Farmers who have sown rape seed along with oats or barley have found to their sorrow that in wet seasons the rape plants grow as tall as the grain and furnish so much green material as to make trouble in harvesting the grain. The later seeding of rape with grain is therefore to be recommended as the preferable practice.

(Vile practice. Ed. J. of Ag.)

In sections of the country where the seasons are fairly long, stubble fields may be plowed up and sowed to rape, and a great deal of forage secured before winter sets in. No matter how the seed may be sown, the hardy plants spring up quickly and during the early growth one cannot tell them from rutabaga or Swede turnips. When they reach a height of eight or ten inches they can be pastured by any kind of stock. Rape is most suitable for sheep, with pigs coming second. Of course, the young plants are quite watery ; as they

grow older the nutriment is more condensed and satisfactory.

So far as known to the writer the only insect pest attacking the rape plant is a louse which severely injures it in hot dry weather. This pest is sometimes avoided by planting the rape either very early or very late.

Care must be taken to order forage rape, for many mistakes have been made by seedsmen who have furnished oil seed or bird seed rape instead. These latter varieties furnish plants which blossom about eight weeks after the seed is sown. A field of bird seed rape in bloom resembles a field of wild mustard, the yellow blossoms being visible from a long distance. The true forage rape does not blossom the same season the seed is sown, but bears its blossom and fruit the second year, the same as the cabbage and rutabaga. Bird seed rape does not become a pest like wild mustard, but since the leaves are small like mustard leaves, there is little or no feeding value to the crop. In ordering seed, be sure to specify the Dwarf Essex forage rape. (1) The seed is imported from England, or grown in the Northwestern United States, near Puget Sound. It costs from four to ten cents per pound, according to the quantity ordered. It can be obtained from any reliable seedsman.

Rape is not harvested or cured like hay or other forage plants, but should be fed off in the green state. It can be cut and carried to the stock; in this case the amount the animals receive can be limited, and there is no danger of bloat, which is practically the only source of trouble in its use. Generally stockmen turn their animals directly into the rape field, allowing them to feedat will.

Where the greatest returns are sought, portable fences are used to limit the animals to a given area. Where lands are cheap there is no need of taking so much trouble, the stock being allowed to roam over the field at will. The only danger in the use of rape, as stated above, is from bloating, which trouble is not always easily avoided.

Animals should not be turned into the rape field for the first time until they have been well filled up on other feeds. Experience and experiments have shown that it is greatly to the advantage of stock to have a pasture field of grass adjacent to the rape field, so that the animals can feed on one or the other as appetite and conditions dictate. When pasture is available, bloating will rarely occur, the animals wisely protecting themselves by mixing their feed of grass and rape instead of consuming too much rape.

The rape plant has long been used by the farmers of Great Britain and the Continent, and it has been made use of for a long time past by some farmers on this continent, especially in Canada. Its prominent introduction to the public, however, was brought about by our Agricultural Colleges and Experiment Stations, the leader in this being the Ontario Agricultural College at Guelph. If our Colleges had done no other work than bring this one plant to the attention of our farmers generally, they would have paid for themselves. Stockmen, especially sheep and swine growers, are urged to use rape in a small way at first, enlarging the area sown as their experience in using it and their appreciation of its merits grow.

Note.—Mr. Henry must have been reading the "Journal of Agriculture," as his advice is just the same as we gave upwards of 20 years ago, and have been giving ever since. Ed.

(1) Cole-seed is just as good. Ed. J. of Ag.

THE HAY TRADE.

An industry that has developed of late years is the exporting of hay to Great Britain. The application of the McKinley tariff practically shut Canadian hay out of the American markets, so that we have had to look for a market elsewhere. The past season has been a fairly satisfactory one to exporters, as the ruling values at the different foreign markets were main-

tained on a stable profitable basis. The average freight paid from Montreal was 20s. per ton for cut hay, and 30s. per ton for long hay.

The development of this trade and the methods employed for putting the hay in the very best shape for shipping purposes is most interesting. In 1893, owing to a short crop in Great Britain, a very large business was done in exporting Canadian hay. But it afterwards received a check, chiefly owing to the English trade requiring a different grade of hay to ours, and that it was not properly packed. It took 180 cubic feet to stow one ton, and bales were of irregular sizes, ranging from 100 to 300 lbs., making it impossible to select a large quantity of one grade in uniform packages. To overcome these and other difficulties a number of experiments in the way of pressing, grinding, etc., were tried. A plan was tried whereby the hay was ground into meal at small cost and put in bags containing 112 lbs. each, which would stow as well as bagged flour. It was found, however, that this plan injured the food, and had to be abandoned.

The second plan was to chop the hay at Montreal and re-press it. By this plan a uniform bale was secured, but the cost was too great. A third attempt was to re-press ordinary baled hay to one-half its bulk by hydraulic pressure. This landed the hay in good shape, but was too costly. A fourth and rather novel plan was to have the hay chopped, mixed with mushed grain and syrup, so as to make a complete ration called "Faramel." This allowed for uniform packages, uniform grade, with fair stowage, but it remains to be seen how it will take, being as yet only in its initial stage. The fifth endeavor to put hay up in attractive form is now under way, it being merely good, pure hay pressed in uniform style by means of the Lowry press at very moderate cost. It is claimed for this style of pressing that a stowage of 70 cubic feet to the ton is attained, that bales are of uniform size, that they can be put up of uniform grade, that it improves the quality of the hay, giving that sweet smell when opened, so much wanted by the English trade. Besides, the bales are so neat and compactly put up that practically no litter is left behind from handling.

The hay trade of Canada is a very large one, and consequently any concern which can put up hay in an attractive form to suit consumers in the market to which it is shipped, and at the same time reduce its bulk sufficient to facilitate its being handled by railroad companies and steamship lines cannot fail to be a great advantage to the country at large, more especially farming interests.

FARMER'S INSTITUTES AND AGRICULTURAL EXPERIMENTS.

Hearing it mooted that a number of Farmers Institutes are to be run in the Province, and started may be in a short time, I think a few remarks under the above heading may not be out of place, and give a word of warning, lest the same Institutes, under moving spirits of too high aspirations, may strive for too great reforms in too short a space of time.

Every would be reformer is too prone to assume that he found the ground quite unoccupied; to forget that anybody ever did anything in the same direction before he started on his own account: and to assume the airs of an originator, with a stock of aspirations every one of which can be proved to have been patented by somebody before he was born. But in these Institutes we certainly have some advantages of power to take concerted action, means of exchanging assistance, and of diffusing intelligence, which might not have been possessed before in trying agricultural experiments.

It will surely be conceded that no experiments of any kind--dealing, as they do, with life, weather, soils of infinite variety —need to be tried so often and so widely, and under so many different conditions, in order to obtain the law which really underlies the whole of them. Agricultural rule of thumb and habit of guessing (very good things as far as they go, and when

nothing better is obtainable) can never be superseded by real knowledge until hundreds, or rather thousands of seekers after the same end have joined, over and over again, and compelled Nature to give up her secrets. It is certainly to be believed that knowledge (when achieved) is an infinitely higher possession than ever were the tact and the knack of seeing the right place, minute, and method of action which is what our forefathers had. But the knowledge is difficult to win; and never so difficult as when life—animal or vegetable—is a factor in the problem. There lie hundreds of problems ahead of us, for the solution of which experiments—local and repetitive—are essential. And if these Farmers Institutes will take them up, and if Government will devote a little money to them, both will be doing a great service to our Province.

We should never fear the want of employment if we would discover why animals thrive or waste; why plants are fertle or unproductive; or what is the life-history of the minute organisms to which we now owe so many of the lucky changes—or confounding mishaps—of stock are very generally to be traced. We cannot have too many experiments or experimenters; if only one or two important facts be constantly kept in mind.

How often do we see pamphlets sent out by enterprising seedsmen, good in their way, but the information given, as a model for the farmer, about the very worst that could be conceived.

One great fault being that "we cannot see the wood for the trees"; there seems to have been throughout an endeavor to ascertain more, and more varied, results than is possible at one attempt for the most carefully trained observer. Now, the never-to-be-forgotten characteristic of the kind of experiments which are wanted in agriculture, and which have to be conducted by local bodies, is that they must be stripped bare to the kernel. They must be simplicity itself in the point to be determined by one experiment. All side issues, all indirect consequences, all additional inquiries, which are likely to confuse an untrained observer, must be most carefully omitted, where omission is possible, and left out of consideration when they cannot be excluded. Experiments of the kind that are really likely to benefit those now occupying land—or about to enter upon the occupation and cultivation of land—must involve only one step at a time, for that is how great heights are achieved, and that, too, happens also to be the way that undeveloped intelligences are best attracted.

In most agricultural communities there are now a days men of science and learners. The former may be left to themselves. If the right stuff be in them they want no helpers. The learners are the class that the proposed Institutes should foster; and the old Greek motto, that "the half is more than the whole," must be the rule in dealing with them. Swift's rule for conversation is the rule for those who would convey sound knowledge to any such intellects:

> Only give them of the prime!
> And give but little at a time.

To mix up questions of variety, of big or little seed, of time of planting, of the effects of one dressing as a preventive, and another as a manure, is to insure that the learners will assimilate the least quantity; and be gorged with the greatest amount of indigestible matter, which their minds will hasten to forget—if unluckily, it does not stay by them in a misunderstood and therefore misleading, form.

There are some, who having been insensible hitherto to the value of experiments, are now bent on making their charges run, before they have learned to walk: and to give them,—to interest them in a pursuit which is novel to them—matter in a form that would sicken a German professor.

The tendency of almost every amateur teacher of the agriculturalist is to assume that every pupil has grasped all the details he has himself in his hold: and that his pupil's mind moves "pari passu" with

his own. As I have said, it is not the few brilliant exceptions, who will learn much at Farmers Institutes. It is the honest plodder, who wants to know, and for whom no single step onwards can ever be too small, and no pains can be in excess of what is absolutely wanted. D'Israeli once said of ordinary farmers, that their chief characteristic difference from other classes was that they spent their lives in the open air, and read nothing that they were not forced to read.

A local experiment should be limited in its programme: and the report of it strictly confined to the record, in the plainest terms, of the approach made to the one truth which has to be discovered.

The principle that should be laid down, is the same for grain, leguminous plants, and animals. There must be only one inquiry in each experiment. Any attempt to combine two, will most likely vitiate the answer to both, and leave everything undecided, as it was before the start. Of course, there may be several distinct experiments going on at one and the same time in any season: but, even so, it will be found best that the actual scene of any experiment, should not be overburdened by the having to consider in it two problems at one time.

In fact, the teachers of the farmers want the caution that Shakespeare puts into the mouth of Wolsey, that, if technical education in agriculture is ever to be more than a fad—a mere pedagogue's fad—we do "throw away ambition"; and be content with small advances. This is the only safe course, for those in authority in Farmers Institutes, and the making sure of little gains, to pursue, if the Province and country is to be benefited.

W. R. GILBERT.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

SPRING.

The duties of a housekeeper are doubled at this, the spring time of the year, she has so many enemies to contend against, that there is little wonder that some of them get beyond her control, as the moment the sun beams peep into the house the many little pests that have lain dormant during the winter come into active life.

That dread little enemy to her belongings, the moth, has already sent out scouts and woe to those careless people who do not take this warning and put out of their way anything of value; for it will be more than useless to fight them when the whole force comes on. Valuable furs should be put into bags, when not in use. Surely it is not much trouble after coming in from a walk to give the furs a shake, pop them into a new or clean bag, tie the mouth of this firmly; thus, you will be safe from anxiety.

Those who think this too much trouble deserve the fate which will surely be of their own seeking.

All clothing that has hung in closets should get a good shaking and airing once a week, not forgetting the carpets, which should be swept well with a good sprinkling of salt once now and then; a little of the salt always remains behind; this the moth does not like.

It is so much nicer and cleaner since rugs and stained floors have come into fashion; these or the square of carpet, leave the corners of the room free to be kept clean, as it is next to impossible to work a broom into these corners when covered with carpet, which is a free sporting ground for insects of all sorts.

I have little sympathy with people who keep a swell room for visitors only, which has to be shut up for that use. Of course, the moths play havock here, and no wonder.

BLACK BEETLES :

Another annoying pest, which breeds so quickly that before you realise that they are in the house, they become such a horrid nuisance that it is a work to get rid of them. Fresh rhubarb leaves placed about their haunts smooth side of the leaf down, are said to act on them like a drug ; they lie about in an insensible state and can easily be swept up and burnt. Another way to help is to stop up holes with cement. Chloride of lime put into their haunts and holes will soon kill them off.

Fleas and bugs will succumb to benzoline. This does not stain anything and the smell will soon go off.

Few wooden bedsteads are in use, now, yet a neglected spring bed is apt to get them between the wires and wooden bar-joints ; but this is a small matter as a couple of washings with benzoline, turpentine, or carbolic acid will soon kill but this must be done thoroughly ; not in a half-hearted way ; use a paint-brush and let the fluid soak well into every crevice or crack, and trust this work to nobody but those who will do the work faithfully and well.

MITES IN CAGES.

Throw a white cover over the cage at night, and the mites will be found on it in the morning ; burn this or put it into boiling water. Wash the cage and sprinkle about it and the bird a little insect powder.

Do this faithfully for a few days and the bird will soon be free from them, and will show his gratitude in renewed, glad song.

MILK.

There is nothing like competition to bring out the value of anything, and when it comes in such a valuable article as milk, consumed by old and young, it is doubly welcome.

Thanks to this we are now served with pure clean milk at 7 cents a quart sent to us in glass bottles, sealed by a card board stopper, which has to be broken when taken out, thus securing to the consumer a certainty of the pure article without any trickery on the road to them. It was indeed hard to often pay 8 cents for milk and water. One can't help feeling sorry for the poorer class of milkmen, but they will have to join the reformers, at least in price, or pay the penalty of opposition. I trust this reform will reach the poorer classes, who have no means of keeping milk from one meal to another.

LENTEN DISHES.

Milk enters so largely into the composition of so many dishes and has now to take the place of gravy, what should we do without milk, butter, and eggs at this season is a question not easily answered ; for those who know best how to serve these valuable assistants in many shapes and forms, know best how to serve up many and savoury dishes so as to make Lent only a time of abstaining from meat, which is no hardship. These, coupled with a good supply of vegetables, obviate any cause for discontent.

CHEESE PATTIES.

Ingredients :—

1-2 oz. of butter.
3-4 oz. of flour.
2 oz. of Parmesan cheese, grated.
1 1-2 gills of milk.
3 eggs.
1-4 teaspoonful each of pepper and salt.
Pastry.

Method : Line some tartlet tins with pastry ; to cut out rounds, the size of the tins, with a cutter is the best way, and the tins should be slightly greased. About a quarter of a pound of pastry will be required. Fill the tins with the following mixture : Melt the butter in a saucepan, stir in flour and milk, and let it boil five minutes. Take away from the fire, stir in the cheese, salt, pepper, and the eggs, beaten to a froth, the white of an egg should be omitted, however. Bake the patties in a brisk oven, about twenty minutes, and serve them very hot.

Eggs boiled twenty minutes are more readily digested than if boiled five ; they are dry and mealy and more easily acted upon by the gastric juice.

The whites of eggs will froth more rapidly if very cold ; a pinch of salt added helps to cool them in warm weather.

ODOURS FROM COOKING FOOD.

Everyone knows that whilst some odours which arise from cooking are agreeable, others have a coarse, offensive smell, which insinuates itself into every room in the house unless proper precautions are taken. There are, however, some simple methods of counteracting disagreeable odours which should be known in every kitchen.

For instance, adding charcoal to the water in which cabbage is boiled, vinegar to boiling fish, and having an open vessel of vinegar boiling on the range while cooking onions. The last is exceptionally effective. But if an abundance of fresh air is constantly supplied to the kitchen, and if there is a free exit for that which is odour-laden ; if all vessels are closely covered during the process of cooking, and all doors leading from the room tightly closed ; very little of even the strongest odours will permeate the other rooms of the house.

To apply labels to tin, use glue softened in water, then boiled in strong vinegar, and thickened while boiling to a stiff paste with wheat flour. A little quinine added will keep the compound from spoiling.

Stains of eggs may be removed from silver spoons by rubbing them with a little finely powdered salt.

Chop lemon peel fine, mix with it a little salt, and store in wide-mouthed bottles, to season meats and soups. (1)

Salt dried in the oven, then reduced to a fine powder in a mortar, (1) if stored in airtight cans or boxes, will not harden even in damp weather.

(1) Lemon-peel, like nut-meg should be used very discreetly. ED.

The Garden and Orchard.

(CONDUCTED BY MR. GEO MOORE).

THE POTATO.

Chemical composition of the potato

(Continued).

As the chemical composition of the potato-tuber greatly controls its proper cultivation, its proper storage, its comparative nutritiousness, and its tendency to healthful development or disease, it ought to be thoroughly understood by every farmer, every gardener, and every dealer in potatoes.

If the peculiarities in the chemical composition of the potato had been known and attended to, more effective methods of treatment than any yet practised would have been adopted, and many errors arising from ignorance, or a desire to experiment, might have been avoided. A few of these peculiarities, as comparing the chemical characteristics of the potato with beans, oats or turnips, may be pointed out in order to show that the most intelligent handler of potatoes has something yet to learn.

The proportion of water is much greater than in beans, wheat, or oats, but smaller than in turnips. The consideration of this fact should influence the method of storing : potatoes should be always quite dry when stored for the winter. The potato, after the quantity of water is taken away, is not much inferior in its proportion of starch to corn, while the turnip contains none. This gives the potato a high standard, in some respects, as an article of food.

(1) A "pestle and mortar" are necessary adjuncts to every English kitchen, but are seldom seen here. ED.

Starch, when exposed to the action of certain diluting acids, or even water, at a certain temperature, is converted first, into gum and then sugar. In corn and the legumes, the starch is contained in the parts growing above the ground, whereas, in the potato there is none found in these, but only, in the tuber. In the turnip, no starch is found either in tops or root, but in the expanded part of the underground stem which we call the turnip, it is replaced by sugar. On the other hand, the quantity of protein, one of the essential elements of animal nutriment, is small in comparison with that of wheat, oats, or beans ! and yet an acre of a good crop of potatoes produces a greater amount of protein than one planted with any other crop.

If we examine the inorganic structure of the potato we shall find that it differs from other plants by containing a new large proportion of potash and very little soda. The potato resembles wheat and oats in being richer in magnesia than lime, but it differs from all grains and legumes by containing only a small proportion of silica. These peculiarities are chiefly interesting with regard to the manurial substances which are carried off the land by the potato crop, and to serve as a guidance with regard to what crop will best succeed it, and what kind of manure is best fitted to restore the land to its normal condition.

The great productiveness, and facility of cultivation of the potato, have caused it to be spread over large areas, and have made it a staple article of food in many countries, but the very ease and simplicity of its culture and care, have led to abuses and neglect which have rendered the plant more liable to disease ; one of its peculiarities is this liability : we scarcely find any other similar to it in this respect.

The value of potatoes, as food for man and beast, will be estimated high or low, according to our notion of the nutrimental value of starch as a main principle of nutrition : if we regard starch as such, we pronounce potatoes superior to some grains and all pulse ; but if we view starch as merely an element of respiration and regard the nitrogenous principles as the true formers of blood, membrane, cartilage and muscle we must come to the conclusion that, even dried potatoes, weight for weight with all seed crops, are greatly inferior to them. According to the most recent discoveries, the nitrogenous principles or protein compounds, albumen, casein and gluten, are really the most important, and analysis shows the order of vegetables in which these exist should be placed thus : 1 beans, 2 pease, 3 Oats, 4 wheat, 5 maize, 6 rye, 7 rice, 8 barley, and 9 potatoes. All the subjects which nature presents to us for our nourishment are mixtures and invariably contain a proportion of the nitrogenized matters and the salts required to build up the framework of the body. It is true that, in the potato, the muscle-forming elements are found in small proportions, hence the poor who used to be confined chiefly to a potato diet, ate them in large quantities, and this while securing even more starch than is required, secure a fair quantity of the other nutritive ingredients.

It is a law of nature that any matter, to be useful for the nutrition of the body, must contain some form of nitrogenized material—some albumen as in potatoes, and some gluten as in wheat, or some casein as in pease. As we know that starch can be dissolved in boiling water, it seems strange that in the operation of cooking by boiling potatoes in water, it should not become soluble ; but in the potato, the starch is confined in small separate cells, which also contain a minute portion of albumen, which is operated on by the application of heat in the very opposite direction, curdling, and becoming a firm mass. Therefore, in boiling potatoes, though we dissolve their soluble salts, and expand the grains of starch, yet the hardening of the albuminous matter which lines the cells, confines the starch to its place and prevents its loss and diffusion through the water.

As regards the potato tops, analyses

show that they contain a variety of nitrogenous compounds which render them valuable as manure. By seven ton of potato tops we can added to the soil, about 23 lbs. of ammonia, which may be compared with 2 1-2 cwt. of the best guano, (1) the only difference being that we have the potato tops as part of the crop, and should have to purchase the guano.

In diseased potatoes, the albumen and gluten disappear in a great measure, but we will treat on the disease of the potato in our next.

Note by the Editor.—Sir John Lawes showed long ago that starch is "a main principle of nutrition." (2) The potato is, in our opinion, the only root that pays for cooking for stock.

The Dairy.

LLOYD ON CHEDDAR-CHEESE.

The composition of milk.

The composition of the milk with which the cheese-maker has to deal affects, as will have been seen in this report, the proportion of rennet to be used, the acidity which may be obtained in the whey before drawing off, and the acidity which should be present in the curd when this is taken to the cheese-room.

Its influence on the proportion of rennet, and on the acidity of the whey when drawn, was most marked at Haselbury in 1895, as may be seen by consulting the results for that year. The high percentage of fat in the milk, coupled with the comparatively low percentage of casein, necessitated a more careful handling of the curd than usual. Consequently, it was found necessary to draw off the whey, and take the curd from the tub from 22 to 36 minutes sooner than had been customary in former years. Hence the acidity of the whey when drawn was always less than the acidity of the mixed milk.

The influence of the composition of the milk on the acidity of the liquid from press is shown in the following table, which gives the average amount of fat in the milk, and the average amount of acid found in the liquid from press, for the three years 1893-4-5, and for three months of 1891 :—

COMPARISON of ACIDITIES and FAT during the Year 1894 and 1893-5.

Month.	Year.	Locality.	Average Percentage of Fat in Milk.	Average Acidity of liquid from Press.
April.....	1893	Butleigh.....	3.09	1.08
	1894	Mark.....	3.29	1.05
	1895	Haselbury	3.70	1.11
May	1893	Butleigh.....	3.05	1.02
	1894	Mark.....	3.35	1.08
	1895	Haselbury	3.39	1.12
June.....	1893	Butleigh*.....	3.08	1.01
	1894	Mark.....	3.40	.99
	1895	Haselbury †....	3.51	1.09
July.	1893	Butleigh*.....	3.20	.89
	1894	Mark.....	3.47	1.02
	1895	Haselbury *...	3.60	1.12
August.....	1893	Butleigh*.....	3.19	.90
	1894	Mark.....	3.70	1.04
	1895	Haselbury† ...	3.80	1.09
	1891	Vallis.....	3.87	1.07
September..	1893	Butleigh*.....	3.53	.94
	1894	Mark.....	3.93	1.02
	1895	Haselbury †. .	3.94	.98
	1891	Vallis.....	4.13	1.11
October	1893	Butleigh*.....	4.30	.95
	1894	Mark.....	4.39	1.04
	1895	Haselbury ‡...	4.55	1.08
	1891	Vallis	4.75	1.22

* For first week in month only.
† For first and third weeks in month.
‡ For first week only; during third week there was a taint in the milk which prevented proper acidity being developed.

It is perfectly evident from the preceding facts that the greater the knowledge which a cheese maker can obtain as to the composition of the milk with which he has to deal, the better.

Unfortunately, such knowledge is not easily obtained. The most simple guide to the richness of the milk is the weight of

(1) The guano of 1850 contained 17 % of ammonia. ED.

(2) More on this point in our next. ED.

curd which is produced from one gallon of the milk. The amount of fat can be approximately estimated by the creamometer though more accurately by the Babcock or Gerber tester. The determination of the acidity of the milk will also afford some indication of its quality.

THE FAT OF MILK.

In all the estimations of fat this substance is isolated and weighed in little glass flasks. Experiments were made, first by mixing it with hot water, to dissolve out any acid soluble in water that might be present; but only a trace could ever be found. Then the fat was treated with alcohol, to dissolve out any acid soluble in alcohol, and the acidity of the solution was estimated. In some years no soluble acids were obtained, but in 1896, both in the fat of whey and in that of curd, an appreciable amount of acid substance was found. I have calculated the acidity present as oleic acid, and the following table gives the average results obtained from about ten determinations made each month in both whey and curd :

Percentage of Oleic Acid in Fat from Whey and Curd.

——	Whey.	Curd.
May	....	4.10
June	30.74	8.84
July	31.20	6.94
August	16.18	3.10
September	17.79	3.55
October	19.08	3.94

The results vary with each cheese in a somewhat remarkable manner, for which fact an explanation has yet to be sought. One experiment was made by determining the acidity or oleic acid in the fat from a cheese when ripe to compare it with that found in the same curd at the time of vatting. The results were as follows :—

	Per cent. Oleic acid.
On Sept. 7th, 1896, in curd	1.98
On Nov. 25th, in cheese	2.23
On Jan. 28th, 1897, in ripe cheese	2.23

Practically no change seems to be produced in the fat by ripening.

I am unable to trace any relation between the acidities produced during cheese-making and these oleic acid determinations, so that it would appear that the fat in the original milk varied in nature from day to day.

In 1895, the fat which was coming from the press was found to be not ordinary butter-fat, but a fat of exceptional properties. It had the normal composition of butter-fat in most respects, but its melting point was as low as 54 deg. F., the solidifying point being 51 deg. F. In another instance a sample of this fat showed solidifying point 66 deg. F., the fat in the whey butter from the same milk had a solidifying point of 79 deg. F., while the average melting point of butter-fat is about 89 deg. F. The question thus arises, does this fat form a regular constituent of milk-fat ?

(To be continued).

WARN CHEESE MAKERS.

To the Editor of the "Journal of Agriculture."

Dear Sir,—I was just sitting down to pen you an article on Fodder Cheese when this came to hand, it is so good that I would ask you to publish in full.

WARN CHEESE MAKERS.

The Montreal Butter and Cheese Association have issued the following circular:

Montreal, Feb. 19, 1901.

Gentlemen,—The Montreal Butter and Cheese Association desires to draw the serious attention of Canadian dairymen to the undesirability of manufacturing in Canada any cheese at all from fodder milk, either at the beginning or the end of the seasons, believing this to be in the interests of all classes, from the farmer to the exporter, connected with the manufacture of full grass cheese.

It requires no argument to prove that if our cheede is to be sold at remunerative

prices during the season of production, it is essential that there should be no large quantity of the previous season's production left over at the commencement of the new season. It must, therefore, be in the common interest of all concerned to see that no impediment is placed in the way of the free sale and free consumption of existing stocks of cheese during all the period up to the arrival of new full grass goods on the market in Canada, even at the cost of some immediate loss of money. Now, the experience of recent years proves that the average world's production of full grass cheese, which is sold on the English markets, consists chiefly of Canadian, United States and New Zealand makes, besides the English home make, is as large as can be consumed in one season at profitable prices. Take, for instance, the present season. The total shipments from Canada and the United States from the 1st of May, 1900, to the end of January, 1901, have amounted to about 2,900,000 boxes, while the English make is estimated to be some 15 per cent larger than that of the previous season. This large production has left a stock of Canadian and American cheese on hand at this date which it will take four months' full average consumption to clear off. If, in addition to this large stock, a large quantity of fodder cheese should be made from new milk this coming spring, it is easily seen that the result will inevitably be a large surplus of old cheese left over on the English markets in June, which will certainly have the effect of retarding the sale and seriously lower the price of new grass goods this coming season. For these reasons it seems to be only the part of wisdom for Canadian producers, who contribute the largest quantity of foreign cheese to the English markets, and whose produce at present stands highest in reputation there, to submit even to some immediate temporary loss on their fodder milk rather than any fodder cheese at all, either at the beginning or the end of the seasons, as they will assuredly reap a substantial advantage in the higher prices and increased reputation they will afterwards obtain for their full grass goods.

In advocating this policy this association does not forget the difficulty the farmer is faced with in disposing of his stable-fed milk. It would be better, if necessary, to throw this class of milk away rather than manufacture it into cheese; but such a sacrifice is not necessary. While it seems impossible to manufacture a first-class article of cheese from stable-fed milk, it has proved that by scrupulous cleanliness and scientific methods a very fine article of butter can be made from this milk for which there is always a good demand from domestic sources and a considerable demand for export, at good prices. This association, therefore, strongly recommends the factorymen as far as possible to provide themselves with alternative machinery for making both butter and cheese, and where it is not possible for the farmer to work up his fodder milk into butter, it is strongly recommended that he should put it into stock. There is a substantial profit to the farm in feeding to the stock the skim milk from the creamery, or even the full milk where necessary, in the consequent enrichment of the soil, besides the price obtainable from the stock itself.

I am, gentlemen, yours truly,

P. W. McLAGAN,
President.

And in conclusion would say, like the Darky Preacher:

Them's ny sentiments exactly.

Yours truly,
PETER MACFARLANE

March 1st, 1901.

The Poultry-Yard.

SELECTION OF SITE FOR BUILDINGS AND YARDS.

Too often the location of the poultry house is thought to be of minor importance, and consequently is given less consideration than that of any other farm building. Frequently the other buildings

are located first and the poultry house then placed on the most convenient space, when it should have received consideration before the larger buildings were all located. In caring for the various classes of live stock, the question of labor is always an important item, and the class that requires the closest attention to petty details, as a rule, requires the greatest amount of labor. As poultry keeping is wholly a business of details, the economy of labor in performing the necessary work is of great importance. Buildings not conveniently located and arranged become expensive on account of unnecessary labor.

As it is necessary to visit the poultry houses several times each day in the year, convenience is of more importance than in case of almost any other farm building. The operations must be performed frequently, so that any little inconvenience in the arrangements of the buildings will cause not only extra expense in the care, but in many cases a greater or less neglect of operations that ought to be performed carefully each day.

Poultry houses are likely to be more or less infested with rats and mice, unless some means are provided to exclude them, and this should be taken into account in selecting a location. It is generally best to locate the poultry house at some distance from other farm buildings, especially if grain be kept in the latter. Convenience of access and freedom from vermin are two desirable points to be secured, and they depend largely upon the location. Everything considered, it is safest to have the house quite isolated.

A dry, porous soil is always to be preferred as a site for buildings and yards. Cleanliness and freedom from moisture must be secured, if the greatest success is to be attained. Without doubt, filth and moisture are the causes, either directly or indirectly, of the majority of poultry diseases, and form the stumbling block which brings discouragement and failure to many amateurs. It must not be inferred that poultry cannot be successfully reared and profitably kept on heavy soils, for abundant proof to the contrary is readily furnished by successful poultrymen who have to contend with this kind of land. The necessity for cleanliness, however, is not disputed by those who have had extended experience in caring for fowls, particularly the less hardy breeds. That an open, porous soil can be kept comparatively clean with much less labor than a clay soil, will be evident to those who are at all acquainted with the habits of domesticated fowls. When the fowls are confined in buildings and yards, that part of the yard nearest the buildings will become more or less filthy from the droppings and continual tramping to which it is subjected. A heavy or clayey soil not only retains all the manure on the surface, but by retarding percolation at times of frequent showers aids materially in giving to the whole surface a complete coating of filth. If a knoll or ridge can be selected where natural drainage is perfect, the ideal condition will be nearly approached. Where natural favourable conditions as to drainage do not exist, thorough underdrainage will go a long way toward making the necessary amends to insure success.

The Grazier and Breeder.

JUDGING BEEF CATTLE.

Address by Thos. Crawford, M.P.P., to Cattle Breeders at the Provincial Winter Fair.

Judging cattle is one of the most important subjects in connection with agriculture; that is to say, it is important that we should know how to do it in order to enrich our farms and fill our coffers where cattle-raising and feeding is practised. Now, a good deal of the success of feeding depends upon the judgment shown in buying. In buying steers to feed, two factors demand attention—they are, profit and quality. Quality in the prime steer is one of two kinds—one is in-bred and the other in-fed. We have in this steer before us both qualities. This animal is practic-

ally a pure Shorthorn, which we claim is the best breed for the butcher, and the breed that is, of all others, most profitable for feeding. He has a well-shaped, blocky form. We may say that this steer is very close to perfection so far as form is concerned. He has good quarters—that is, they come well down right to the hock. That is where you get your best cuts. When you have such quarters as this, you have an animal that will give you the greatest quantity of the most expensive meat and bring the best results so far as the block is concerned. Then, he has a wide loin, filled right up so that you can scarcely span it. He is close ribbed, well rounded, and deep bodied; standing not too high from the ground. That steer is about as near perfection as you can have it. This comes only from good ancestry. You cannot get a beef animal of the shape and build and style of the one we have before us from a Jersey, or Ayrshire, or a Devon.

Q. What about the general purpose cow?

Mr. Crawford: I think we can produce very good testimony to show that, so far as the dairy industry is concerned, it will not suffer by having Shorthorns sufficiently mixed with the dairy breeds to produce good results for beef as well.

HOARD vs SHAW.

Prof. Shaw will not suffer much under the excessively rough rod of "Hoard's Dairyman." Mr. Shaw's teaching as to "dual-purpose" cows is in perfect accordance with the almost universal practice of English dairy-farmers, who, except in a few localities, place their sole reliance on the "Dairy-Shorthorn."—Ed. J. of A.

PROF. SHAW AND HIS PET THEORIES.

Happily for the farmers of this country, the teaching of the experiment stations is righting itself on this subject (dual-purpose cows). The band wagon of dualism on the cow question has been driven rapidly through all the stations in recent years, and in nearly all of them teachers of animal husbandry are jumping on. These men are recognizing what many shut their eyes to before, viz.:

1. That dairy form is only a general, not an absolutely infaillible guide as determining dairy capacity.

2. That inheritance in milk-giving is a powerful factor in milk elaboration, notwithstanding the absence of the highest dairy form.

3. That food also exercises a powerful influence in determining what the milk production of a cow will be, despite her lack of high dairy form.

Men have bowed down and worshipped at the shrine of dairy form, dairy inheritance and dairy food products.—Prof. Thos. Shaw, at the late meeting of the Minnesota Live Stock Breeders' Association.

"Hoard's Dairyman" asserts, without fear of successful contradiction, that Prof. Shaw is entirely unwarranted in what he says in the above. He has been for a long time a very much over-rated teacher on live stock questions, for he is g beef man, pure and simple, and has shown by his talk that he has never been a close, deep student of dairy functions, dairy breeding, dairy form, or dairy cattle. The experiments made by Prof. Haecker, at the Minnesota Experiment Station, where Shaw is employed, effectually disprove all that he has ever said on the subject. Shaw should be taken for what he is worth, a beef thinker and talker, and no more.

FEEDING VALUES.

(*Pretty plain speaking! Ed.*)

(1) What is the feeding value of wheat and oat chaff from the ears compared with their respective straws?—(Superior). (2) What is the feeding value of pea chaff or shells made in the process of splitting or grinding peas compared with peas?—(Inferior). (3) What is the manurial value of (a) bracken or ferns, (b) flags cut in ditches, (c) rushes as compared

with wheat straw ?—(Superior). (4) What ought soot to be worth for dressing wheat (with nitrate of soda at 10s. per cwt.) ? The wheat in question is after seeds, and is to be followed by potatoes—poor sandy loam. Whether would nitrate, rape dust, or soot be best to use ?—(About 4d. per bushel).—D. P. S. (A veritable examination paper for honours ! The questions belong to that numerous class of which it has been said they are more easier asked than answered ; and "D. P. S." should understand that no tables of the ground composition of foods can be relied upon. Foods differ in quality, even if of the same class. Animals differ in digestive power with regard to foods, as well as in age and condition. Plants differ according to the soil and season. Any definite answer is therefore impossible).

"Eng. Ag. Gazette."

FOODS FOR FATTENING CATTLE.

May I ask, through the medium of your valuable paper, which of the following mixtures would be the most profitable feed for fattening cattle, taking prices into consideration, given with a liberal quantity of hay and swedes :—1 cwt. of maize, 6s. ; 1 cwt. of crushed barley, 6s. ; 3-4 cwt. of crushed oats, 4s. ; or 1 cwt. of decorticated cotton cake, 8s. 3d. ; 1 cwt. of crushed barley, 6s. ; 1 cwt. of crushed oats, 4s. ?—ENQUIRER. ("Enquirer" may not appreciate the extreme difficulty, or impossibility, of answering his question. We lean to the latter mixture on account of the manurial value of the cotton cake. We think in both cases the oats might be omitted with advantage for fattening cattle, as they would be better bestowed on milking cattle or sheep).

The Horse.

HORSES FOR GREAT BRITAIN.

A communication has been received by the Minister of Agriculture from the High Commissioner's office transmitting a letter received from Mr. King, Manager of the Horse Mart, Trafford Park, Manchester, of which the following is a copy :

"Your valuable letter of the 16th, which appeared in the Manchester "Guardian" of yesterday's date, prompts me to write you respecting the business of Canadian horses, which I am convinced is capable of great development in this country. The reduced exports from Canada, as against increasing exports from the United States of America, proves that the industry is not thoroughly worked in Canada, where (or at least in some districts) there is an almost bewildering supply of horses in breeders' hands. The establishment of the above-mentioned business at Manchester has led me to correspond with many well-known men in the trade, but there appears to be considerable apathy in Canada about pushing export business, and the result is that America is stepping in and taking the large bulk of the business, to the loss of Canada. There is a splendid field at Manchester for a large horse trade with Canada, as the direct is so densely populated and has such vast requirements for all kinds of horses. Of course, I do not presume to ask you for any personal influence on behalf of our individual business here (which is curiously the only one of its kind at present owing to past requirements having been obtained in or via other ports of the United Kingdom); at the same time you will observe there is a very powerful company behind the Manchester Horse Mart, with a capital sufficient to justify the attraction of large Canadian exports to Manchester, as soon as breeders on the other side can be woke up to the fact that there are extensive and regular requirements of Canadian horses

in England and a good market for the same at Manchester. The Manchester Liners trade regularly between this port and Canada, and the accommodation on them for carrying live stock is very first-class. Please pardon my troubling you with this letter, which I have written on behalf of Canada and for the sake of Canadian farmers. If you suggest any way by which we can promote business I will gladly follow your lordship's counsel."

It has been suggested to Mr. King by the High Commissioner that he should consider the question of sending a representative to Canada for the purpose of bringing the advantages of the mart before interested parties in Canada.

Swine

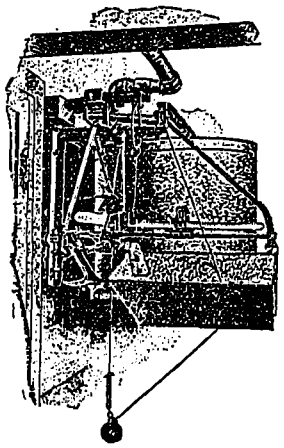
THICK OR THIN SLOP FOR PIGS.

Many persons make ground feed just wet enough to pour from a pail, others feed it quite liquid, while others again feed it dry. Which is right? At the Swine Breeders' convention last year, when the question of wet and dry feed was up for discussion, Prof. Henry said that he first thought feeding dry gave the best results, but fuller experiment showed that wet feed did, but he did not say how wet, and thought that feeding dry would give the best results in very cold weather. In this others agreed.

The Indiana Experiment Station recently undertook to find out how much water with ground feed would give the best results. Some 16 Chester White and Yorkshire pigs were put up to feed and divided into four lots of 4 each. When put up the pigs averaged about 60 lbs. each. Lot 1 was fed their meal dry. The other lots had water added to their ground feed. Lot 2 an equal weight, lot 3 twice, and lot 4 three times the weight of grain feed. Besides this the pigs in lots 1 and 2 were given all the water they desired, but a record was kept of the amount they used. They were on feed 146 days, and their feed consisted of pure corn meal and shorts; later a little hominy took the place of the corn meal. To make one pound of gain, lot 1 required 3.59 lbs.; lot 2, 3.80 lbs.; lot 3, 3.74 lbs., and lot 4, 3.75 lbs. of grain. This is very close work with the results in favor of dry meal. Lot 1 drank 3,374 lbs. of water; lot 2, 3,031 lbs.; lot 3, 4,871 lbs., and lot 4, 6,927 lbs. An equal weight of water added to the oatmeal was not sufficient to satisfy the wants of the pigs in lot 2, and undoubtedly lot 4 had too much. At the beginning of the experiment, when averaging about 60 lbs. a piece, the different lots used 2.35, 2.42, 4.25 and 5.79 lbs. of water respectively per head per day. At the close of the experiment, when averaging from 213 to 222 lbs. a piece, the water consumed was 11.07, 8.17, 14 and 18 lbs. respectively per head per day. There was no material difference in the appearance of the pigs in either lot so far as quality was concerned. The results of this experiment go to show that the proper amount of water to feed mixed with ground grain is about twice the weight of the grain. However, in view of the fact that the pigs fed dry grain made the cheapest gain, it would appear that there is really no gain in feeding pigs a slop instead of dry meal, excepting as the feeder regards it as a matter of convenience.

BANNER OAT TESTS IN SCOTLAND.

Canadians will be pleased to know that the Banner oat, so well known throughout the west, has stood at the top in a test made at the West of Scotland Agricultural College by Professor Wright. He selected eight varieties of more or less well-known British oats; two other varieties were furnished by Messrs. Gartons, the well-known seed specialists; and two varieties were obtained from Dr. Saunders, director of the Dominion Experimental Farms. The British oats were Providence, Potato, Sandy, Hamilton, Longhoughton, Newmarket, Tam Finlay, and Black Tartarian. Messrs. Gartons' oats were their Tartar King and Pioneer, and Dr. Saunders's were Banner and Improved Ligowo. In order of "total value of crop" the leaders were:—1, Banner; 2, Longhoughton, Potato, and Hamilton; 3, Black Tartarian; and 4, Pioneer. These experiments have more than the ordinary value, in that the experiments were carried out on seventeen different farms.



Some People

never provide for the future. They never lock the barn until their best horse is stolen. Don't think that because you have never yet gotten into any serious trouble over the distribution of your skim-milk that you never will. When you least expect it is usually when the lightning strikes. A mighty little dissatisfaction will soon breed discontent among your whole list of patrons.

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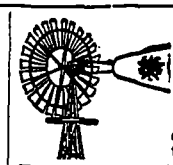

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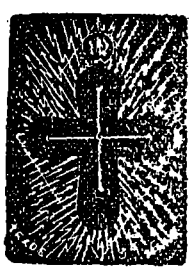

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TILSONBURG, ONT., JAN. 24, 1901.

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E. D. TILLSON,

E. R. ULRICH & SONS,

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