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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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THE

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A WELL-MERITED HONOUR.

(Special to *The Mail and Empire*).

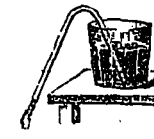
Ottawa, June 2.—At the last session of the Royal Society of Canada Mr. F. T. Shutt, the chemist of the Dominion Experimental farms, was elected a fellow of the society on the recommendation of the section of mathematical, physical, and chemical sciences. Mr. Shutt took his degree of M. A. at Toronto University in 1885. He is a fellow of the Chemical Society (England), a fellow of the Institute of Chemistry (England), and a fellow of the American Chemical Society. He was fellow in chemistry at Toronto University when appointed to his present position of chemist to the Dominion Experimental farms, in 1887. He was British (professional) juror at the World's Columbian Exposition in 1893—the only foreign chemist, and was there engaged on an analytical examination of cereals sent in competition from all parts of the world. Mr. Shutt has read several important papers in previous years before the Royal Society, e.g., 1. The economic improvement of alkali soils (with analytical data and illustrations); 2. Methods of milk analysis, their relative accuracy compared; 3. The results of two years' experiments at the Central Experimental farm with nitrogen—a preparation for encouraging the growth of the legumes, with analytical data and illustrations. Besides the annual reports of the chemical division of the farms—the twelfth being laid on the table of the House of Commons last week—and bulletins on special investigations, Mr. Shutt has contributed largely to the press of Canada, writing on matters relating to the principles and practice of agriculture. When the British Association met in Toronto two years ago Mr. Shutt presented a valuable paper on the character and composition of Canadian soils, in which was

contained the results of many years' research on this important subject. The work of Mr. Shutt as chemist of the Experimental farms has been characterized throughout by accuracy and thoroughness, and has furnished many results of immediate and practical importance to Canadian agriculture.

Notes by the Way.

Home-made superphosphate is not a difficult thing to compass; only, can must be taken not to let the acid splash over the workmen. To avoid this, place the carboy on a raised platform, and empty it by means of a siphon.

A good sized wooden tub does very well to mix the phosphate and acid in. The materials may be thus proportioned; 500 lbs. of phosphate of lime in the form of bones, or mineral phosphate; to which add 15 gallons of water, and mix thoroughly, and then pour on slowly from 300 to 350 lbs. of sulphuric acid, according to the quality of the phosphate. This is, of course, not at all



Siphon.

theoretically perfect, but it answers well in practice. When finished, dry the superphosphate up with ashes.

Failure of clover.—Boussingault, the great French agricultural chemist, suggests that the failure of the clover-plant is due to the exportation of the products of the farm. "If," says he, "the fodder is consumed on the spot, the greater part of the constituents of the plant will return to the manure after passing through the animals; and as a clover-crop takes up 77 lbs. of alkali (potash and soda), the food of clover will be always at its command. But if the fodder is sent to market, this will alter the position; it is to the continuous export of the product of the artificial grasses that the failure of the clover, as observed in soils, which have long produced it in abundance, is undoubtedly due."

This will not solve the problem. In England, particularly in the Eastern Counties, clover fails, as we have often mentioned, if repeated more than once in twelve years, i. e., three rotations; and, there, nothing is *exported* but grain, pulse, and meat. Tons upon tons of cake, beans, etc., and of artificial manures are *imported*; and yet the clover fails on repetition. To us, the cause of failure seems to be that the land becomes too loose to hold the roots. Bossingault recommends potash, wood-ashes and soda: Lawes and Gilbert can find no manure successful in restoring *clover-sick* land to its original condition. Liebig admits that the physical conditions essential to the fertility of a soil are generally neglected by the chemist; but the fact that, in the fine farms under the chalk-downs of S.E. England, no good crop of wheat can be raised after vetches, unless rape or turnips fed-off by sheep intervene, shows the importance of the point in question.

Taste of wool in mutton.—One often hears people complaint of that peculiar flavour in mutton that they are pleased to call the "woolly taste." It is

not by any means due to the wool, but arises entirely from the careless mode of slaughtering too often practised in the country. We have ourselves seen a dozen or more sheep and lambs with their throats cut and their necks broken, left on the floor of the slaughter-house, for an hour or more, before they were emptied of their bellies. It is this vicious practice that confers the bad flavour on the meat: the wool has nothing to do with it.

The American potato-crop is by no means so large as it might be. As may be easily calculated from the subjoined figures, the average crop of potatoes in the States is equal to 74 bushels, of 60 lbs. each, equivalent to about 80 bushels, English weight, of 56 lbs. each; in other words, as the average crop of potatoes in England is 220 bushels to the acre, the English crop is 2¾ times as large as the crop in the States.

AMERICAN POTATO-CROP.

Crop of	Acres potatoes	Yield in bushels Per acre	Total crop
1898,	2,778,000	73	203,264,000
1897,	2,745,000	64	174,116,000
1896,	2,865,000	86	245,480,000
1895,	3,204,000	88	286,350,000
1894,	2,914,000	64	185,000,000
1893,	2:605,000	72	183,000,900
1892,	2,506,000	62	155,000,900
1891,	2,660,000	93	250,000,000
1890,	2,606,000	58	150,000,000
1889,	2 601,000	76	218,000,000
1888,	2,533,000	80	202,000,000
1887,	2,357,000	57	134,000,000
1886,	2,287,000	73	168,000,000
1885,	2,226,000	78	175,000,000
1884,	2,221,000	86	191,000,000
1883,	2,289,000	86	208,000,000
1882,	2,172,000	78	171,000,000
1881,	2,042,000	53	109,000,000

As we have noticed before in this periodical, the yield of wheat in the States bears nearly the same proportion to the yield of wheat in England, as we have seen is the case in the potato-crop.

Wireworm.—T. W. S —Will any of your readers kindly inform me if rape cake should be used in a powdered state, and what manurial value there is in it, also good firms to buy from? [Rape cake for wireworm should be well broken, but not reduced to flour. We do not give here the name of firms, but advise you to consult our advertising columns. The manurial value of rape cake is high, and it is an excellent fertiliser, apart from its powers of preventing wireworm. Use 4 or 5 cwt. per acre.]—*From Agricultural Gazette.*

A good deal of damage is done every spring by this queer little creature. The *elater lineatus*, or wireworm, attacks all sorts of crops, potatoes as well as grain, and any means of getting rid of it would be very welcome to the farm. From the egg, it passes three years of its life as a worm, and then changes into a soft white pupa, which remains in a cell in the ground for a year, at the expiration of which period, the body hardens and the eggs are deposited.

The Cornell Station, of New York, after trying all sorts of remedies, came to the conclusion that the only successful one was fall-ploughing! Paris-green, tar, copperas, strychnine, kerosene, the sowing of crops on which the wireworm will not feed, such as buckwheat, mustard, rape, etc., thus, so to speak, starving the pest to death; all proved futile.

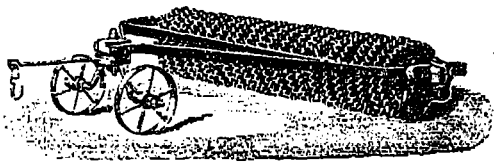
Among other things, trapping by lanterns was tried at the Station. *Eighty* specimens (*click-beetles*), were caught, attracted by six trap-lanterns lighted every night from May 1st to October 1st! Really, if the funds so liberally devoted to the promotion of agriculture by the States are wasted in this manner, no wonder practical farmers cry out against such extravagance; for, though the oil may not have been costly, a man must have gone every night to set the traps, light the lanterns, etc., and every morning to empty the traps and extinguish the lanterns, etc. Well, the proceeds of the *chasse* were: 6 lanterns for 153 nights are equal to 1 lantern for 918 days; so that, as 80 beetles were caught, it took one lantern 11½ nights to catch one beetle. May it not, there be truly said of such work as this, that "*Le jeu ne valait point la chandelle?*"

In the experiments with rape, the Station authorities had probably heard of Mr. Charnock's prize-article, "On the Farming of the West-Riding of Yorkshire," published in the Royal Society of Agriculture's Journal, in, we think 1849 or '50. Mr. Charnock, now with God, whom we knew well at Lennoxville some 20 years ago, described an experiment with rape-*cake*, for the destruction of the wireworm, which succeeded perfectly. The cake was not crushed into meal, but broken up

into pieces the size of a hazel-net, and sown broadcast, at the rate of 6 cwt. to the acre. The worms feeding greedily on these lumps, over-ate themselves, and perished wholesale by repletion, as many as five or six worms being found dead and attached to some of the pieces. Satisfactory enough, but, unfortunately, Miss Ormerod, the entomologist to the Royal Agricultural Society, tried the same plan in 1888, and it did not succeed.

In our opinion, and we speak from experience; there is no perfect cure for the ravages of this wretch but *pressure*. Did our readers never remark that when the rest of a field of oats, or other grain, has been thinned by the wireworm, the headland has been left uninjured? We have; notably, in 1886, or thereabouts, on a farm near Sorel.

In 1848, we had in Kent, England, a piece of oats, on lightish loam, severely punished by the pest immediately after the plant was above ground. We immediately sent to Messrs. Crosskill, of Beverley, Yorkshire, for one of their heaviest *clod-crushers*—weight, 25 cwt. gross—, and, on its arrival, passed it twice over the oats, lengthwise and across. The effect was magical! We tried the same process on our own and our neighbour's farms, wherever the crops were what used to be called, severely *grubbed*, and *in every instance* it arrested the ravages of the invader.



Crosskill's Clod-crusher.

The "clod-crusher" may be described as a roller composed of from ten to sixteen moveable discs, playing loosely on a spindle, each disc being *vandyked* on the periphery, and having blunt teeth attacked to its sides.

If this implement is used to crush clods, we recommend farmers to pass it over the land *before* harrowing; otherwise, like all rollers, wheel or smooth, it will simply press the clods into the soil. The effects of the disc-harrow, in clod-crushing, are infinitely superior to the work of the "Crosskill," as it is familiarly called in England.

The fall-ploughing recommended by the Station at Cornell can have no effect on the wireworm itself, as it remains in the ground all the winter without food; but it may be useful in destroying the pupæ in their tender state.

The only notice taken in pressure in the bulletin is: "as worms do not thrive well in compact soil, it is a good practice to roll the infested land in the spring." You may roll for ever with one of the *smooth* rollers, never mind how heavy, and the beast will only laugh at you. But try a *Crosskill*, or a *Cambridge* (wheel-roller), and it will tell a very different tale.

As to the manurial value of rape-cake, Lawes' analysis gives it, per ton of 2240 lbs., as:

Nitrogen	Potash	Phosphoric acid
48.0	13.2	24.6

COMPETITION OF AGRICULTURAL MERIT.

Report of the Judges.

No. 6.—M. J. B. Richard.

On the 25th of July we visited M. J. B. A. Richard's farm at Joliette. It contains 90 arpents, all in cultivation.

The soil is a very poor sand, but M. Richard has improved its fertility in a marvellous way by two methods:

First, by drying it by means of a peculiar system of deep water-furrows; a good lesson to those who think that sandy soils do not need warming-up; secondly, by laying on all the manure required by the crops.

And by these means, this poor land has produced this season crops equal in every respect to those yielded by the very richest land.

There are 35 arpents—yes, we really mean *35 arpents*—of fine tobacco; 2½ of beans; ¼ of swedes; ½ of potatoes; 1 of maize; 2½ of barley; 16 of splendid oats, 5 and 6 feet high, etc., etc; with 28 arpents of fine meadow, with lots of clover.

Every year, M. Richard ploughs in a piece of clover, for the purpose of enriching the land with nitrogen (1)

The rotation is perfect, and there are no weeds.

Very little live-stock kept; M. Richard draws

(1) As he keeps no cattle, he does not need the clover for feed. Ed.

dung from the town, and buys plenty of artificial manures.

This farm is a genuine school of agriculture, and ought to be inspected by all the farmers within reach.

M. Richard is a specialist of the greatest merit.

OBSERVATIONS

The farmers, whose performance we have just described, are those who this year, 1898, have so earnestly competed for the gold medal.

We were very rigorous in our decisions.

All of them are men of high reputation, and may safely be consulted by the public when advice on agricultural subjects is needed.

We pray them to accept our heartiest congratulations, and we trust they will all once more enter the lists in 1903.

FOR THE SILVER MEDAL

Almost all the competitors who won the silver-medal this year are new to the competition ; all of them are worthy of the public attention.

No. 7.—M. Charles Rivet.

The 29th of July saw us inspecting the farm of M. Chas. Rivet, at Joliette. It is about 150 arpents in extent, 15 of which are in hoed-crops, and 1 head of stock is carried to every 3 arpents.

There are two siloes, a great saving in the winter feeding of stock ; for this we assigned 13.75 marks.

M. Rivet sowed 30 acres of grain with turnip-seed. At the time of our visit, they were looking well, and of course they would grow rapidly after the barley, etc., were cut. This very abundant crop was remarkable on account of its rarity. (1)

The crops were, in general, regular and good.

Seeing how well the land was drained, and how well and deeply it was ploughed, we were not surprised at the yield of the crops.

M. Rivet is a man of active habits, and he makes his land as active as he is himself. He reminds us of what Father Champagne, of St. Eustache, of agricultural memory, used to say : "The land needs plenty of pulling about, if it is wanted to yield well."

M. Rivet often ploughs 12 inches deep ! He preaches by example as well as by precept.

(*Obs.*) And yet the *agriculturist* at the Ontario farm college advises and practises shallow ploughing We belong, we avow, to the deep-ploughing faction ; provided it is brought about by degrees, and always precedes a manured crop.

M. Rivet is a well-taught farmer, who has ideas of his own, but who is, nevertheless, a genuine model.

We gladly gave him 93.30 marks ; a diploma of very great merit, and the silver-medal.

For the marks, see the table, at p.

No 8 —M. Hormisdas Mayrand.

One of the finest farms we saw in our tour was that of M. Hormisdas Mayrand, at St-Léon, Maskinongé.

There is no mistake at all about it. The air of order and tidiness about the buildings and their surroundings tells you to stop there, for it is the abode of the competitor which you are about to visit.

The same order reigns over the whole 145 arpents the farm contains, 135 of which are under the plough, 5 in permanent grass, and 5 in bush. There is, too, a fine garden.

The rotation is a good one ; M. Mayrand takes great care of his manure, and, in order to increase it, keeps a large number of cattle, etc.

Pigs he breeds in quantities. There were, at our visit, twenty well bred hogs ; some in the sties, some in the clover-field ; but twice that number are often kept.

The most important improvements are : the carting-off of several thousand loads of stones ; good ploughing ; well kept ditches and water-courses, etc., etc.

The yield of the farm is abundant all over.

M. Mayrand started by going to the States and making and saving enough there to enable him, on his return, to buy his "paternal arpents," which he has kept in spite of the bad times *au prix de grands sacrifices*. But he is a man of method, very intelligent and well bred. It was a great pleasure to us to appreciate his deserts.

To M. Mayrand we assigned 91.25 marks, which entitle him to the silver-medal.

(*Trans. from the French by the Editor*).

(1) We should prefer leaving the land without a double crop, and cleaning the stubble with grubber, harrows, etc. ter harvest. Ed.

The Dairy.

ABOUT BOILERS

All creameries and cheese factories are fitted with a boiler and, generally, an engine. It is not always the case that the superintendant fully understands the economical principles which govern the production and utilization of steam. I purpose in this article to dwell more particularly upon these principles, than upon the ordinary every-day care which is given as a matter of course.

A steam boiler is used for the production of steam. The steam produced, as long as any water remains in the boiler, will be of a pressure having a certain relation to the temperature, and the pressure can only be increased by increasing the temperature. The source of the heat is the combustion of fuel. Some of the heat is directly radiated into the boiler another part is conducted into it through the flues and tubes, and a large percentage goes up the chimney. The safety of a boiler in one sense depends upon its ability to resist the pressure within it. The steam pressure produces stress in the material of which the boiler is made; the amount of stress depends upon the shape of the part affected and the pressure of steam. The ability to successfully resist the stress depends on the quality and quantity of material.

In order to determine the question, at what pressure is it safe? the diminutions, conditions, shape and quality of material in a boiler all require to be examined and carefully considered.

Safety depends next upon proper usage, and that proper and skilful usage may be given to a boiler, such attachments as steam pressure gauge water gauges, feed apparatus, etc., are essential and must be kept in perfect trim and running order.

The internal condition of a boiler affects both its economy and its safety. Nearly all waters used in steam boilers contain more or less of lime or other earthy matter. These remain in the boiler and in time cover the inside with a coating of matter which offers resistance to the passage of the heat. The inevitable result of this is that more heat goes up the cheminey and less enters the water. With certain kinds of deposit the resistance to the passage of heat becomes so great that the plates become hot enough to be seriously injured, so much so that explosions frequently occur from this cause.

Sometimes a corrosive action takes place between the scale and the surface of the plate by which the tkickness of the plate becomes reduced and weakened. The internal condition of a boiler, whether or not scale is forming in it, the action of the water on the iron, the condition of the stays, the effect of the ever varying expansion or contraction of the boiler, upon the stays and rivets, all these require careful examination and consideration.

I am sure it is not generally known, what the origin of the term "horse-power" is.

When steam engines first came into general use, some standard for the power which could be obtained. Many of the early engines were applied to perform work previously done by horses, hence engine builders began to offer to supply one engine to do the work of eight, ten or thirty horses. Competition led to disputes as to what the power of a horse really was, and with a view of fixing some standard of work, James Watt, conducted experiments to find how much work a horse could do. He tested the most powerful horses to be found in London, and fixed upon the standard of 33,000 pounds avoirdupoids raised one foot high in one minute of time as the power of a horse.

This standard remains in used to-day, and nearly all other nations using steam engines have adopted standards which are practically the same.

Now comes the actual application of the term "horse-power" to the power of a steam-engine. Power is really a combination of pressure of 33,000 pounds moving with a velocity of one foot in one minute, or it may be expressed as being 33,000 foot pounds per minute. To apply this standard to measure the power of any given engine, the size of the steam cylinder, the average pressure on the piston, and the velocity of the piston in feet per minute must be known.

A steam pressures are usually measured in pounds per square inch, the diameter of the cylinder must be measured in inches and the area in square inches determinated in order to get the total pressure in pounds pressing upon the piston, and has the velocity of the pressure is measured in feet per minute, it is usual to measure the length of stroke in feet and the speed of the engine by the number of revolutions it makes in one minute.

The horse-power is found by multiplying to-

gether the area of the cylinder or piston, the average pressure of steam, and the number of feet per minute travelled by the piston, and dividing the product by 33,000; the answer is the horse-power.

For example, here are the dimensions of our engine in the creamery.

Cylinder 10-inch diameter and 10-inch length of stroke makes 140 revolutions per minute, and the average pressure on the piston 30 lbs. per square inch, what is the H. P.?

Area of 10-in. cylinder = 5 × 5 × 3.1416 = 78.5
Speed of Piston in Feet per minute = 233.33
Average pressure on piston 25

$$\frac{78.5 \times 25 \times 233.33}{33,000} = 13.876 \text{ H. P.}$$

This same term "horse-power" is applied to boilers as well as steam engines, and leads to wrong ideas from the assumption that a boiler Horse Power is the same as an Engine Horse Power.

Strictly speaking boilers cannot be properly described as being of so many horse power because they do not produce power; they merely produce steam, which gives a pressure, and when that pressure is applied in an engine, power is produced.

The application of the term horse-power to boilers arose in this way: In the earlier steam engines it was noticed that one horse-power of work was done by the engine, for each cubic foot of water turned into steam by the boiler. For many years the Horse-Power of boilers was measured by the number of cubic feet of water used for feeding the boiler in one hour.

As steam engines were improved the quantity of water required to produce a horse-power of work became less, and in this country and the United States, it has become the rules to measure the horse-power of boilers by allowing 30 lbs. of water evaporated from 100° F. temperature, and raised to a steam pressure of 70 lbs. per square inch as the equivalent of one Horse-Power.

It is very difficult to make an accurate test that will determine the horse-power of any given boiler. One great difficulty arises from the water going out of the boiler with the steam. The quality of the steam has to be determined, and as they may be constantly varying, it is almost impossible to get a truly accurate test. It is not so difficult to measure what a boiler is doing, but to prove that what it is doing is its full power, is a different matter.

H. Weston Parry.

The Farm.

POINTS IN HAY-MAKING.

Definite rules for hay-making cannot be laid down. So many circumstances have to be taken into consideration, such as the nature of the crop, the dampness and dryness of meadows, the humidity of the atmosphere, the intensity of sunlight and heat, that methods must necessarily vary in order to meet these different conditions. But there are certain general principles which must be well understood and strictly followed in order to carry out these operations successfully, and secure hay with the least possible loss of nutrients and palatability.

The most important condition in hay-making is to cut the fodder at the right stage of maturity. A few days of delay often means a considerable loss in nutritive matter. This mistake is often made by farmers having a large area of hay to cut: very often the last field is over-ripe and worth little better than straw. It should never be forgotten that the loss from cutting underripe hay is always less than that from cutting it overripe. Hay-making should always be commenced early enough so that the last field to cut shall not have passed the proper stage of maturity.

In Timothy, it has been shown that the accumulation of nutritive matters continues up to the last stage of maturity. According to this fact, several authors seem to favor its cutting only when the seeds are ripe, thus securing the greatest bulk possible. It is also claimed that horses and fattening steers, mostly fed on concentrated food, will do better on such hay. But its loss in palatability render it much less suitable for cows and sheep than early cut hay. Investigations carried on for 3 years at the O. A. C. in order to determine to what extent the value of hay is affected by its degree of maturity have conclusively proved that the digestibility of grasses decrease with maturity. The same experiments also demonstrated that the most favorable time for the cutting of Timothy is soon after the first blossom has fallen, or in the period of "second bloom." We know that on a spike of Timothy, the upper end is the last to come in bloom, and the blossoms stay there for some time after they have fallen from the other portions of the spike. This is known as the "second bloom period."

It is in the full bloom period that clover contains the largest amount of nutrients. Past that stage, its digestibility and its amount of *protein* or flesh-forming substance rapidly decrease, but the time required for curing it is much lessened, owing to the loss of water which clover sustains after that period. All factors considered, theory and practice agree in fixing the proper time of cutting hay when one third of the blossoms are turning brown. (1)

In the process of hay-making, grass may suffer from losses of several kinds, caused by bleaching, or exposure to dew or rain. Bleaching occurs when new mown hay lies for a time in the sunlight. This indicates that chemical changes are taking place, thereby lessening the nutritive value of hay. The dew which escapes in the morning from the hay that has been left scattered over the meadow during the night, carries away a great deal of its aroma, thus lessening its palatability. Rain washes out the greater part of soluble matter of hay.

Gathering up grass into bundles hastens considerably its chance into hay. According to Prof. Henry "the grass stems remain alive for some time after they have been severed by the mower. If grasses whose leaves are still fresh are gathered into bundles so that the leaves are not at once withered, the leaves will continue to draw water from the stems and in so doing rid them of moisture and hasten the drying grass towards the condition of hay."

Although it may not always be profitable or wise to cure timothy hay in cocks, yet it must not be forgotten that this method is the only one which, under the majority of circumstances, will give first-class hay. Timothy is easy to cure, and thereby, often overcured. It should not be left in the sun any longer than when it has reached that stage which admits of its being easily raked together. Then, it should be drawn into windrows where it may remain, in settled weather, until cured. On the other hand, it will always be found advantageous to cure clover in cocks.

It is yet a matter of discussion as to whether salt should be scattered over hay when it is put in the mow. It is believed, however, that salt prevents fermentation and checks the growth of moulds and mildews. Hence it is valuable when partially cured hay is stored during bad weather. But there does not seem to be any good reason advanced why properly made hay should receive any salt at the time of storing, provided the stock are supplied with sufficient salt.

C. MORTUREUX.

NOTE.—We never saw a good grass-farmer, in England, salt his hay. Doubtless, in Lancashire, in the West of Scotland, Galloway, &c., and in Ireland, where the weather is by no means favourable to hay-making, salt is used to make the hay palatable. ED.

(1) With which position we beg to differ most utterly. ED.

THE EDITOR OF THE AGRICULTURAL JOURNAL

DEAR SIR.

I think that you might very well add two more sheets on farm work to your Journal, on the cultivation of the farm, rotation of crops, and the growing of the many varieties of fodder-plants unknown to most of the small farmers.

Many of the farms that I know, consisting of one hundred and fifty acres, are divided into fifty acres of wood and rough paturage, fifty acres of pasture for cows and horses, and fifty for hay, grain and a few vegetables. This has continued for a number of years without any change. Ten or twelve cows, two horses, and some young stock are kept. No labour is employed except during haying and harvest. The farmer and his wife rise at 4 o'clock a. m. and work until dark.

I should like to see the very practical and scientific Editor of the JOURNAL OF AGRICULTURE take this question of rotation and the fodder plant into consideration. I think he could handle the subject, as well as any one I know. There was a report that the Department of Agricultural intended establishing small model-farms all over the Province. This I consider would be a useless expense, if I may judge from the effect, on the small farmer, those already in existence have had. If the Agricultural Department wishes to change the system of farming, why not follow on the lines they adopted when they wished to induce the farmer to support the cheese factories and creameries. Instructors were sent round among the different establishments, giving lessons to the factory men, and seeing that the work was properly done. Surely a system of this kind could be adopted; the increase of farm produce would be very great and the cost small.

In my last letter I gave you the amount of feed that could be grown on good arable land, feeding thirty cows for the seven winter months. The same amount of land growing different varieties of fodder-plants, will keep the same cows during the five months of summer, provided that they are kept in a well ventilated stable in the daytime with wire blinds to the windows and wire doors to keep out the flies, the cows will then rest in peace, very differently to what they would do in an open pasture, obliged to travel and cut their own food the greater part of the day. At night they can be turned into a ten acre field, near the stable for exercise.

The farmer may object to this feed, as the cows are liable to scour, but not more so than on the grass in the pasture.

This however can be avoided, by cutting the fodder once or twice a week, partly drying it, and then putting it into cocks and drawing it to the stable when most convenient. The whole time spent in this work will not be more than that occupied in driving the cows to and from pasture, besides it will not be necessary for the farmer to get up at four in the morning.

As the whole of the hundred acres of the arable part of the farm will be under cultivation, there will be a large increase of grain and other crops, thus enabling the farmer to keep more young stock, pigs, etc.

This system will change the whole farming interests of the country. The income of the farmer will be greatly increased; he will be enabled to engage an extra man and boy all the year round; the fertility of the soil will be increased; his work will be lighter; and he and his wife can take a holiday when required. In fact the whole commerce of the country will be affected.

AYLMER.

THE FARMER AND THE BIRDS.

The above is the title of an interesting and instructive book from the pen of Miss Edith Carrington, of Bristol, who is an authority upon birds and their habits. The book is admirably printed by Messrs. George Bell and Sons, York-street, Covent Garden, London. Miss Carrington touchingly pleads in the interest of birds and their humane treatment, and she might thus be described as the birds best friend. The preface is from the pen of Canon Tristam, F.R.S., in which he says he does so "with pleasure for no one can more cordially sympathise with the objets of the kind hearted authoress than myself. Miss Carrington has collated in a small compass a mass of evidence to show that every bird has a duty to perform. Every possible thing has been said in favour of birds, no attempt has been made to blink the fact that, at certain times, some species inflict a certain amount of injury on man, indirectly, by attacking his property in the field or garden. But it is maintained that after taking a fair estimate of their work all the year round, and setting the good done by them against the harm, a balance must be struck in favour, unless, indeed, through the destruction of their enemies they have unduly increased. The theory of the compiler, in a nutshell, is this: that while the over-multiplication of certains birds may be dreaded, the presence of all, in moderation is useful; and that where such over-multiplication has taken place it is wiser to use natural rather than artificial remedies. Miss Carrington does not attempt to bring forward the sentimental side of the matter, but it is as agriculturists' useful helper. If the lark pilfers a grain or two of corn, or a little sprouting wheat, does he not pay the price of wheat he takes, several times, by picking up insects that would devour ten times as much? How much stuff will one turnip grup and its progeny destroy, and how many turnip grubs does a lark and his family consume in a season? And it is after this fashion that Miss Carrington argues in a very lucid manner. The work is divided into four parts, namely, workers over-head, workers on the ground, summer workers, workers all the year, and slandered workers, with an appendix on the law about birds. She concludes with the following suggestions:—"Anybody who considers that wild birds and their eggs do not receive sufficient protection in the neighbourhood should press his representative in the County Council to bring the matter before that Council with a view to obtaining increased protection for them. It would be advisable if, in addition to information obtainable at the police stations, the particulars of bird and egg protection were made widely known in all districts. This may be done through the Press, by printed bills affixed in conspicuous places, and by the teachers of National and Board Schools, who should make their scholars aware that laws exist for protecting wild birds and of their obligation to keep these laws." Altogether,

Miss Carrington's work is deserving of perusal, pleading as it does for the protection of our feathered tribe, and especially the song-birds whose thrilling notes affords so much pleasure both at home and in the fields.

THE HOUSE SPARROW.

"The House Sparrow in relation to agriculture and gardening, with practical suggestions for lessening its numbers," is from the pen of Mr. W. B. Tegetmeier, F.Z.S. He traces the natural history of, the house sparrow, its habits, food at various stages of life and different seasons of the year, nesting, its mode of life, and distribution as a parasite on man; its influence on the important occupations of agriculturists and horticulturists, its action in driving away useful insectivorous birds; and finally he endeavours to demonstrate the extreme injury that it inflicts on farmers and others in this country. Mr. Tegetmeier says that it was computed at a very low estimate that the amount of damage done by sparrows in this country cannot be taken at less than some millions per annum. He also shows from his point of view that many thousands of farmers in this country are with hardly a single exception convinced of the immense damage inflicted on them by the house sparrow, but in this we cannot agree with the conclusions which he arrives at. He, however, with fairness, quotes the opinions of witnesses in defence of the sparrow, some of whom contend that sparrows feed their young almost exclusively on insects and not on vegetable substances; and he also offers suggestions for diminishing the sparrow plague by means of well-contrived traps. The book is published by Messrs. Vinton and Co, of New Bridge-street, London, E.C.

TO SUPERSEDE THE PLOUGH.

The latest development of the Romaine farming machine, an invention that has been before the public for some years, is at present being tried on the Bennet farm, Maisonneuve, where it was inspected with interest on Saturday by a delegation of senators and members of parliament. The machine is compact and reduced in weight to about three tons, and is driven and operated by a little pair of sixteen horse-power engines on the top. It travels over the ground at a speed of about one hundred and twelve feet per minute, and cultivates as it travels about four feet wide, equal to about five plough furrows. The action of the machine can scarcely be called ploughing, in the ordinary sense, as it is rotary. Nevertheless, as the knives travel around at the rate of about one hundred turns per minute, they really act like a lot of small ploughs working in a circle. They are not forced down into the ground, but get their depth and hold it by a draft similar to that of the ploughshare. The present machine has two of these revolving discs, with four plough knives on each. The machine moves steadily along at the rate of ten inches to each revolution of the knives, each knife taking about two and a half inches cut ahead. Travelling around in their circle, the knives again traverse or cut through the soil which has been loosened, and the result is a most complete pulverization of the soil, which is rarely obtained, even in favorable soils, except, by the spade. The present machine, it is claimed, can handle about five acres a day, but another is to be built with a capacity of fifteen acres daily. Mr. A. A. Barnhart to whom the evolution of this machine from a crude idea to the present stage, is due, has shown wonderful perseverance and high mechanical ability. Mr. Barnhart hopes to commence manufacturing immediately, and to be able to introduce the machine on the prairies this fall in time for next spring's work. He feels confident of being able to produce a machine which can be sold to the farmer for about four thousand dollars, which will cultivate thoroughly from one thousand to fifteen hundred acres of land, making the first expense much less than for the ordinary plant. The same power is also available for seeding, harvesting and threshing, by simply attaching the necessary implements.—Ex.

SHEEP FEEDING

In this branch of farming, as well as others, the farmer must study the markets and its needs. Many farmers in the United States, adjacent to the large cities where the demand is good, make their money out of sheep by raising early winter or fall lambs, and fitting them for the Easter market. This practice is followed to a limited extent in this country, though the market is not so large. Other successful sheep farmers follow the practice of wintering the spring lambs and selling them when about a year old. When fol-

lowed properly, and the lambs well fed during the winter, there is good money in the plan. The more general plan, however, in this country is to sell the lambs off in the fall. While there may be money and less labor in doing so, the lambs are put upon the market when the supply is the largest, not only of lambs but of grass cattle. The farmer who is so situated that be can specialize a little, and have his lambs ready when a couple of months old, or when yearlings for the spring market, runs a better chance of getting the highest value for his product. In England the demand is now more for young and tender meat. Sheep of light weights seem to be more suitable, as they are generally quoted about 2c. per lb. more than heavy weights. Some butchers there would not buy sheep over two years of age. Quarters weighing from 10 lbs. to 14 lbs. make nice family cuts. The British public seems to demande early maturity, and sheep feeders there aim to supply the quality derired.—*Farming.*

COST OF GROWING ROOTS

(*By the Editor*).

Even in England, nobody seems quite theoretically certain whether root-growing is profitable or not, and the reason for this is clear : farmers in that country do not keep accurate accounts of the expenditure incurred in the cultivation of any one of their crops. *Practically*, however, they are pretty sure about the matter, since every farm, except on soils so stiff that summer-fallowing is a necessity, has at least one-sixth of its acreage devoted to the root-crop. It seems to us rather unfair to debit the swedes or mangels with the whole cost of the cleaning and manuring of the land. The cleaning, for instance, rendered necessary by the fouling of the land during the growth of the previous crops of grain, grass, &c. ; and the necessity of manuring the land is due to its exhaustion by those crops. Again, the subsequent crops would cut but a poor figure if the cleaning and manuring for the swedes and mangels were omitted. Lastly, the chemists have succeded in bewidering many half-educated men by the analyses of roots they have published. That "90 % of water" startles many a good honest fellow, who has been accustomed to see his sheep and cattle thrive delighfully, uuder the old-fashioned regimen of cake and roots, and he begins to think it can hardly be economical to cart from field to farmyard such a lot of water. But there is no getting over the facts that hundreds of thousands of cattle of all kinds have been sent to market *ripe-fat*, after having been fed entirely on swedes and straw, and that the great ram-breeders or the South of England, the Webbs, the Rigdens, the Gorringes, &c., when their farms, in June, are covered with trifolium, red clover, tares, and all sorts of green food, will give any price for mangels for their exhibition sheep. And if the percentage of water in roots growing in the field seems to be large, we must not forget that day after day, when stored in the barn-cellar or in the root-house, they are losing water rapidly. Besides, what amount of water does the chemist find in the much vaunted beet-pulp from the sugar-factories ? According to Mr. Patermann, the well known chief of the Gembloux (Belgium) agricultural station, the following are the *average* constituents of best pulp after the diffusion process :

Water	90.00
Albuminoids	0.93
Fat	0.07
Carbohydrates	0.27
Inorganic mater	0.75
Fibre	1.98
	100.00

Compare this with Wolff's analysis of swedes :

Water	87.00
Albuminoids	1.30
Fat	0.1
Carbohydrates	9.50
Inorganic matter (ash)	1.00
Fibre	1.10
	100.00

You see at a glance that the swede is far more valuable than the pulp, for it contains 3 per cent, less water, .37% more albuminoids, .03% more fat, 3.23% more carbohydrates—sugar, starch, &c.—.25% more ash—including phophates for bone-building—and .86% less indigestible matter—fibre. So, you see that, even theoretically, the root-crop is not so despicable a thing as it is too often esteemed to be in this country.

But about this water-in-the-swede-question. It is so bad a thing after all? People who harp so on the matter seen to overlook the fact that this admirable commingling of the water with the cellular matter of the swede assists in producing a natural food suitable to the digestive system of animals. We

do not believe that any man of science would differ from us when we state that in a well grown swede there cannot be found, barring perharps an infinitesimal part of the fibre, any indigestible matter at all. The whole is available for nutrition. If the water contained in root were only of the value of water from the spring, or from the well, as some want us to believe, then we night conclude that dried turnips, moistened with water, would produce the same results as swedes from the root-house! Similarly, it might be held that dried beef and water are as nutritious as fresh beef! Or, that hay and water are as good as grass! Or, that dry bread and water are equal to fresh bread! No one can maintain such a view; and the assertion that the water contained in a swede is of no more value than water from the pump, is therefore open to grave doubt. The effect on the palate, on the flow of saliva, on the animal when eating, must be allowed considerable weight.

Lawes, in his experiments on cattle-feeding at Rothamsted, showed that a ton of roots would produce 14 lbs. of beef or mutton. But this resuts was arrived at by deducting the actual cost of the hay, cake, and meal, fed with the roots, and assigning to the roots the balance in cash left after the sale of the animals. Thus, if a lot of beasts leaves $300, and has consumed $200 worth of other foods, the $100 left would be credited to the roots, and if fifty tons of roots had been eaten, they would be set down as worth $2.00 a ton. To my mind, this mode of computing the value of a ton of roots does not touch the question: how far does the presence of the roots affects the feeding value—i. e. the assimilation—of the cake, hay, and meal?

Mr. Wrightson, the Principal of the Agricultural College at Downton England, but in spite of his occupying that invidious position, a thoroughly practical farmer, esteems the value of root-crops very highly, particularly when they are consumed by sheep. He puts the average value of a ton of swedes at 10s. 4d. sterling = $2.50. In the case of lambs of the improved Hampshire breed, which at eight months old have been sold for from 60s to 80s a head—$15 to $20—he seems to feel sure that the value of roots consumed to account for the yield of mutton cannot have been less than from $4 to $4.50 a ton!

Our own impression is that swedes are worth to the farmer in this county, $2.50 a ton. And now let us see, fairly, what they cost to grow.

First, what is the cost to the farmer of ploughing an acre of land? The wages of a man may be averaged at $1 a day; a horse will consume, say, 10 lbs. of oats and 25 lbs, of hay and straw *per diem* which, at present rates, not counting the straw, are worth, *on the farm*, 17½ cents (1); therefore a man and his team cost the farmer $1 35 a day. (2) They will plough, on an average, an acre and a quarter a day, at least; so, we get, as the cost of ploughing an acre: $1.08:

2 ploughings	$2.16
4 harrowing	0.40
2 grubbins	0.40
Drilling and splitting drills . .	1.20
Loading, carting and spreading 12 tons of dung	3.00
3 lbs. seed and sowing . . .	1.00
Horse-hoeing 3 times . . .	0.75
—Singling—4 women, one day .	2.40
2nd hoeing	1.00
Topping, tailing, carting, &c .	7.00
Rent—i. e. interest on capital .	4.00
	$23 31

Now, supposing the rotation of crops on an average farm in this district to be a seven-course one, we do not think it would be fair to charge the whole of the cost of cleaning and manuring to the root-crop; I think two-thirds will be about right; for in a seven-year rotation you would have your farm divided as follows:

One-seventh in roots or other hoed-crops.
Two-sevenths in grain.
Two-sevenths in hay.
Two-sevenths in pasture.

And the six-sevenths in grain, hay, and pasture, would certainly benefit greatly by the cultivation received by the land in the first division. Deducting, then, one-third of the actual cost of cultivation and of spreading the manure, we find that the crop of roots has cost the farmer just $20.05 an acre. We cannot put the average produce of an acre of roots, well cultivated, at less than 20 *gross* tons an acre. At Sorel, our friends and pupils have grown double that weight. But allowing 20 tons to be a fair crop; the cost of a ton of swedes appears to be $1.00. Now a bushel of swedes will weigh about 45 lbs.; there will, then, be in a gross ton 50 bushels, the cost of which will amount to 2 cents a bushel; a cow eating half-a-bushel a day will consume in the winter half-year, say, 105 bushels, the cost of which will be $2.10. Can

any thing cheaper be found? Belgian carrots will cost a little more, as the singling and the seed will be more costly.

As to the value of the dung which, it will be noticed, I have said nothing about, I would observe that if it were charged for, I should be entitled to value the straw, hay, roots, etc., eaten by the beasts that made it at market price, and this would add very much to the cost of the subsequent grain and grass crops. The fairest plan seems to me to be to value roots, etc., at *consuming price* on the farm and say nothing about the dung. Not that I have any objection, as regards my contention as to the cost of the root-crop, to charge it at market price: that would only add to the strength of my position. For instance: swedes, in Montreal sell freely at 30c a bushel: that would make them worth $15.00 a ton = $300.00 an acre! (1)

As to the mode of growing roots, we would strongly advise all *heavy land* farmers to autumn-clean their stubbles, and plough in the manure in the fall. In the spring, the grubber, the harrows, and the roller, will prepare the land for sowing on the flat. Roll, whether you sow on the flat or in drills, both before and after sowing. If mineral superphosphate could be had for a reasonable price, I should strongly recommend the addition of 2 cwt. of it to the dung; that is, for swedes. For mangels, 125 lbs. to 175 lbs. of sulphate of ammonia will make a wonderful difference in the yield. The sulphate of ammonia can be had at 3½ dollars a hundred pounds at Vasey's, Hochelaga.

We are told that an Agricultural Station will probably be established shortly in this province. If so, we trust one of its duties will be to determine whether sheep folding off green-crops during the summer and autumn is not as profitable here as it is in Britain. We have proved it to be profitable by our own experience at Sorel, where sheep were folded on tares and rape, from July to the 5th of December, leaving the fold on that day for the slaughter-house, *ripe-fat*. As to the crop of oats and barley that succeeded the fold the following year, we can only say what our successor in the farm told us: 48 bushels of barley and 70 bushels of Black Tartar oats to the imperial acre! All the manure used for the tares and rape was 300 lbs. an acre of an inferior ammoniated superphosphate. The sheep had each a pint of oats and pease, mixed, a day while in the fold. Neither tares nor rape require hoeing—simply sowing and harrowing, with a rolling to finish with. The cultivation is as follows:

For tares, a good sound fall-ploughing; 2 bushels of tares and one of oats per acre sown on the stale furrow, well harrowed in, and rolled.

For rape, the fall-ploughing grubbed, harrowed, and rolled, until a good tilth is secured; 8 pounds of seed sown broadcast and covered by a light set of harrows—chain-harrows preferentially—, at all events the seed should not be buried more than half-an-inch deep; and a light rolling to finish with.

Where the land is is good heart, rape will do fairly without manure; but, as a general rule, a few bushels of raw bones, with a little hard-wood ashes, will not fail to produce a crop.

Four pounds of rape and 1½ bushels of tares, per acre, make good sheep-fed. In fact, we, in England, always begin the season with the mixture. In all cases, a little grain or a mixture of both, will profit the sheep and the land. As soon as the sharp autumn mornings make their influence felt, the flock will eat straw-chaff: during mild weather, that is, when the temperature is above 50° F., they will not look at it. The perfect food for sheep, when feeding off rape, is: ½ a pound of pease, ½ a pound of linseed cake, and a little clover-chaff, per head, per day.

You see, with this system properly carried out, the dung-cart is never required; consequently, the outlying parts of the farm, which, in the majority of cases, bear comparatively nothing, can be brought to yield fully as much as the rest of the farm, and that at a very trifling expenditure of time and labour:

One ploughing	$1.10
4 harrowings	0.40
2 grubbings	0.40
Bone-dust, etc	3 50
8 lbs. rape seed	1.00
Rent, interest, etc	4 00
	$10.40

Lastly, on the average of years, we may suppose some of the land on every farm to be cleared of its grain-crop by the 15th August. Why not break up some of this and sow a few acres of fall-rye, with 3 bushels of seed to the acre? This would

(1) M. Séraphin Guèvremont, in his lecture at L'Assomption, asserted that he cleared $95 an arpent by his root-crop.

give an early cut of green-meat for cows in May, and would prepare them for their change of food from dry hay, etc., to grass. Rape might follow the rye, or rape and tares, as before mentioned. Another part might be sown with rape alone, which, if got in by the 25th August, would give a nice bite for sheep by the 10th October, by which time the sheep-pasture is generally pretty bare. There is no end of ways by which this most valuable plant might be made subservient to the great want of the country, the doing away with the notion that there are no means of restoring the worn-out lands of the province without the use of the cumbersome tumbril.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

SUMMER BOARDERS

Not very long ago there was quite a discussion going on in some of our papers, as to the advisability of farmers taking in boarders during the summer. Did it pay them to do so? Surely those who have been in the habit of doing it ought to know best, it is not to be expected that people will work for nothing.

It is a well known fact, that a large number of the present hotels, all down the St-Lawrence river, started, as very modest farm-houses, in a very primitive way, with only a few boarders, till now the old house has quite disappeared and, in its place stands the modern hotel, with its many useful improvements.

The farm has become quite a secondary affair, and is utilised to grow food for the cattle necessary to be kept, to supply the wants of the boarders, during the season.

A good deal of money is made in conveying guests to and from the Railway Station. There is also a constant demand for horses to drive and ride about the country.

The town people are very glad to avail themselves of the rest, and to escape the worry of house keeping for a time, and are, as a rule, fairly content with the board they get.

There are those who grumble, and with good reason, as there is little to tempt delicate appetites, which call for many little inducements to enable them to eat at all.

There is one constant, and united grumble, owing to the lack of fruit and vegetables: People do not go into the country expecting to live on cakes hot and cold, but would gladly give up these for a good wholesome supply of fresh vegetables.

People are apt to expect country fare in the shape of good home-made bread and butter, new milk, new-laid eggs, good ham and bacon; these, with a little fresh meat and fish, with plenty of vegetables; and a fairly good cook, must not be forgotten; one who would serve them all up to the very best of her knowledge.

This would soon fill the hotel to overflowing, and the proprietor's pockets, too.

It needs only a little energy on the part of the proprietor to do all this.

The land is ready, and needs only to be brought into a higher state of cultivation to do all this and much more. It is only the energy that is wanting. As one of the propietors said to me: "Why should I bother myself to alter my ways? I can always fill my hotel as it is!" Perhaps the children of this man; who has not long been dead and is supposed to have left a little nest egg in the shape of forty thousand dollars; these children, perhaps, who are better educated, might learn to do all this in time.

They will have to change their breed of pigs if they hope to see their guests enjoy their bacon and eggs.

THE WASHING AND STARCHING OF SUMMER GOWNS.

To send an originally cheap linen or cotton gown to the cleaner and have it come back with a bill equalling or surpassing the cost of the material when it was new, is not an experience to encourage a taste for "cheap" linens. To have it washed by the laundress and sent up with a faded back and starchy spots throughout is even more depressing. Most of us learn to compromise by choosing colours with a view to the wash-tub rather than to our own taste and complexions; but, after all, there is a way of cutting this Gordian knot, of having our own choice of colours, and keeping them in defiance of time, wash tubs, and starch. Coloured prints, ginghams, cretonnes, and piques of coloured patterns, or of solid colours somewhat doubtful and difficult to preserve, should be washed in bran-water without any soap whatever. Put the bran in a muslin bag and pour hot water on this; when the water is lukewarm take out the branbag and wash your pieces quickly, rinsing them afterwards in clear, cold water, also

quickly. To avoid all chance of fading, hang them to dry in a room without fire or sunshine, and before they are absolutely dry iron them with moderate irons. The great point to bear in mind is to wash, rinse—and starch, if necessary—very quickly, never allowing the pieces to lie in the water. When no soap is used in washing, yolk of egg may be rubbed into grease spots, or places where the material is soiled by contact with the skin. Rub the yolk into the material and wash exactly as if it were soap.

A SEASONABLE BREAKFAST DISH.

The remains of cold roast lamb, a cup of good gravy, a seasoning of mint, some poached eggs and buttered toast, are the ingredients required for this dish. You must mince the meat finely and season it well with salt, pepper and a very little finely chopped mint. Put the gravy into a stew-pan, and as it gets hot stir in the minced lamb and allow it to heat thoroughly, but do not let it boil. Thicken it with a little brown flour, and pile it upon a very hot dish. Have ready some slices of hot buttered toast, cut into neat squares or rounds, place a poached egg on each slice, and arrange these all round the minced lamb. Be careful to serve this dish as hot as possible, or the result will be anything but satisfactory.

SCOTCH EGG WITH MUSHROOMS

Choose small but perfectly fresh eggs for this purpose, then boil hard the requisite number, and when quite cold remove the shells and cover the eggs entirely with a layer of nicely seasoned good veal forcemeat, being careful in doing so to preserve the exact shape of the eggs; next egg and breadcrumb them in the usual way, and roll each one gently in the hands until the coating is perfectly smooth and even, after which fry in hot clarified fat, using sufficient of the latter to quite cover the eggs. When coloured a lovely rich golden brown, take them up, drain thoroughly, and arrange them neatly and firmly on a bed of potato puree, pour round the base some daintily cooked mushrooms, or some thick, well-made mushroom sauce, and serve the whole very hot.

To test butter take a clean piece of white paper, smear a little of the butter on it, roll up the paper and set it on fire. If the butter is pure the smell will be rather pleasant, but the odor will be distinctly tallowy if the butter is made up wholly or in part of animal fat.

BATHING COSTUMES

Red or blue serge is, I think, the ideal material for bathing dresses, and is the most serviceable and the safest wear, because woollen materials do not strike so cold when they are wet as do linen ones.

LEMON MARMALADE

Lemon marmalade is quite as good as that made with Seville oranges, and the advantage of being less widely known. Take a dozen sound lemons. Those of moderate size are preferable to the very large ones, which usually contain a good deal of pith. Slice very thinly, and remove the pips. Allow about three pints of water to each pound of sliced fruit, let this stand for a day and a night. Then boil until the slices are tender, pour into an earthen bowl, and let it remain thus for about twelve hours. Then weigh it, and to every half pound of boiled fruit allow three-quarters of a pound of lump sugar. Boil all together until the syrup becomes of the consistency of jelly and the fruit has a transparent appearance; in taking out the seeds be careful not to disturb the pith, as that helps to make the syrup. Pour into jars and tie down tightly. It is a good plan when storing preserves to put the date of making beneath the name.

EGG LEMONADE

Shake together in a bottle a tumblerful of water in which the white of an egg has been stirred, the juice of half a lemon, and a teaspoonful of pounded white sugar. This is a valuable drink to those invalids who are allowed fluid food only, the white of the egg being pure albumen, which, being taken raw and pleasantly flavored, is acceptable and digestible.

CANNED RHUBARB

Select young pinkish stalks, wash and cut, but do not peel, add a small amount of cold water (not nearly enough to cover), and boil up quickly, sweetening to taste, and seal while hot. Many can it unsweetened, but it is far safer to use the sugar. This makes excellent winter pies, and is keenly relished as sauce during late spring, when the apples begin to grow flavorless. As in canning

pine-apples, only a wooden or silver knife and spoon should be used, the acids turning both fruit and steel knives black.

To remove iron rust apply lemon juice and salt, and expose clothes to the sun.

A little vinegar in the rinse water will prevent delicate colors from fading.

When looking-glasses have a smeared appearance, if rubbed with methylated spirit, they will become perfectly bright and clear. The spirit takes all grease away, and dries very quickly.

Never wrap steel or silver in a woollen cloth. Use soft tissue paper.

The Garden and Orchard.

(Conducted by Mr. Geo. Moore).

IRISES.

The Iris is amongst the most beautiful and easily cultivated of all the hardy perennials.

German Iris.

Peculiarly delicate in outline of form, and with flowers of many singular combinations of color, the Iris might be mistaken for the orchids of the tropics.

The German, or Sword leaved, are the easiest grow and when once planted require little further attention except being kept clear of weeds, and divided when the clumps get too large. The adapt themselves to any common garden soil. One of the peculiarities of the Iris is that the flowers contain blue and yellow sometimes in the same flower, and sometimes the flower of a variety will be all blue and that of another all yellow. This rarely occurs in the same species. We have yellow Dahlias and Roses, but a blue Rose or Dahlia would be as good to the possessor as a rich mine in the Klondike.

NITRATE OF SODA.

Dr Myers of New-York states that the best results from nitrate of soda have been obtained when it has been applied to the soil just as the crops began to grow. Now will be the right time for our friends to try it.

Another new Acalypha. Unlike a Sanderiand, this is a foliage plant the leaves are bright green and regularly edged with creamy white. The flowers are scarlet of a new Lapageria, called the Knoll variety, and it has made quite a sensation in horticultural circles in London.

EDUCATION OF WOMEN IN OUR RURAL DISTRICTS.

Seeing the probabilities are that many of these will become wives of farmers, we should do well to add to our curriculum the arts that would be the most likely to be needed on the farm, and even an outline of the theories and practices of good farming. How much more valuable as a "helpmeet for her husband" would a woman be who had sufficient knowledge of the subject to consult with him as to whether it would be wise to perform certain operations or to forego them. Time spent in such acquirements would not be wasted, even if Providence alotted then a different vocation.

CO-OPERATION.

If there is one thing more than another that we Canadian farmers need, it is co-operation, and there is nothing so hard as to induce farmers to co-operate.

It may be that the distance they are apart in the country, instead of being in closer proximity to each other, as are the dwellers in cities, may have some influence, but there is no doubt that individualism is the rule, and co-operation the exception ; the very reverse of what it should be.

Race distinctions also have some influence. In this respect persons of the Saxon or Celtic races possess a certain amount of sturdy self reliance that makes them think that combination is unnecessary. It is with regret that we have to admit that our farmers clubs, and other co-operative associations and means adopted to help the farmer, are not so well appreciated by the English as by the French Canadians. Even in England, and in the sister colonies, co-operation has not advanced among the agricultural population as among the manufacturing.

Social improvements can only be effected by co-operation. Individuals are powerless alone, but irresistible when combined in thought and action.

Apart from this spirit of self reliance, we have another sentiment in the minds of some, who think that the government should do everything for them, as to the price of their products and the marketing of them.

We cannot expect the Government to do all, and we cannot complain of the efforts being put forth to help the farmers to help themselves, which is all that can reasonably be expected.

Consumers have, by co-operation, secured to themselves cheaper food and clothing ; why should not the producers combine for the purpose of procuring whatever they may require for use, or for the disposal of what they produce.

On the Continent of Europe, in France, Germany, Holland, Italy, and even in Russia, the peasantry combine for mutual assistance. Communities are formed for the purpose of improved cultivation, and expensive farm machinery is purchased by them, and thus individuals can obtain the advantage of performing many farm operations more economically than they otherwise could, and making a greater profit on their labor.

The co-operative system is well illustrated, as to its results, in our creameries and cheese-factories. We never could have had the success in the dairy industry, if it had not been for this.

Now, if our fruit growers and market gardeners in various districts formed corporations for the disposal of their fruit and vegetables, they would benefit thereby. They cannot peddle them out because they have not time ; but if they would co-operate, they might establish a store or market, where a competent manager would be employed, who would dispose of it to the best advantage and keep producers posted as to the daily consumption, so that the market would not be over stocked one day, and empty another.

The Poultry-Yard.

ANIMAL HEAT.

Animal heat during incubation is not noticeable until about the tenth day. Though, a fresh strongly fertilized egg having been under a temperature of 103° for thirty-six hours, and then broken upon a plate, will reveal a live pulsating heart the beats of which may be counted, and it will make about sixty before it stops or dies. As the animal heat increases less artificial heat is required to keep up the proper temperature in the egg chamber. For this reason it is generally necessary to occasionally adjust the regulator a little the last week of incubation ; but the lamp flame should be gradually (a little at a time) diminished if it appears that it is giving more flame than is necessary to supply just a little surplus heat.

When the chicks are excluding from the shells, remember that the doors of the incubator should not be opened more than twice in the day, to take out the chicks that are excluded and have become dry. Again remember when a number of chicks are removed from the incubator, you take with them a certain amount of animal heat and the lamp flame should be increased a little, because the temperature must be kept up to the same point (103°), until the hatch is finished if you want the best results. S. J. ANDRES.

STANDARD VARIETIES OF CHICKENS.

There are eighty-seven standard varieties of, and a large number of promiscuous varieties of chickens raised in this country. The standard varieties are divided as follows :

(1) *American class.* — Barred, Buff, Peacombed Barred and White Plymouth Rock ; Silver, Golden,

White Buff and Black Wyandottes ; Black, Mottled and White Javas ; American Dominiques and Jersey Blues.

(2) *Asiatic class.* — Light and Dark Brahmas ; Buff, Partridge, White and White Cochins ; Black and White Langshans.

(3) *Mediterranam class.* — Brown, Rosecomb Brown, White, Rosecomb White Black Dominique, Buff and Silver Duckening Leghorns ; Black and White Minorcas ; Andalusians and Black Spanish.

(4) *Polish class.* — White crested Black Golden, Silver White Bearded Golden, Bearded Silver Bearded White. and Buff laced.

(5) *Hamburg class.* — Golden spangled, Silver spangled, Golden pencilled, Silver pencilled, White and Black Hamburg ; Red caps ; Silver and golden campins.

(6) *French class.* — Houdans Crevecœurs, and La Fleche.

(7) *English class.* — White, Silver Gray, and colored Dorkings.

(8) *Game and Game Bantam class.* — Black breasted Red, Brown Red, Golden Duckening, Silver Duckening Red Pyle, White, Black, and Birclem Games ; the same varieties for Game Bantams, Cornish and White Indian Games ; Malays and Black Sumatra Games.

(9) *Bantam class other than Game.*—Golden and silver Seabrights ; White and Black Rosecomb ; Booted White ; Buff, Partridge, White and Black Cochins ; Black tailed White, and Black Japanese and White crested White Polish.

(10) *Miscellaneous class.* — Russian Silkins, Sultans, Friggles, and Rumpless.

For practical purposes, the above ten classes may be grouped into four general classes as follows :

(1) The general purpose breeds : The American class.

(2) The meat or table breeds : The Asiatic class.

(3) The eggs breeds : The Mediterranean class.

(4) The ornamental breeds : The Polish, Exhibition, Games, Miscellaneous and Bantam classes.

The Plymouth Rocks.

The Plymouth Rock is the most popular of all varieties of poultry as a general purpose fowl. Its hardy growth, and good laying qualities make it a practical fowl for the farm. The Barred variety is the most generally known of the Plymouth Rocks and its history dates back a little over a quarter of a century.

Various bloods were used in its making, the belief being general that it originally came from a cross between the American Dominique and the Black Java. It has also been shown that the Light Brahma, Dark Brahma and Pit Game have been used in its making. (1)

The Barred Plymouth Rock is of a grayish-white color, regularly crossed with parallel bars of blue-black running in straight distinct lines throughout the entire length of the feathers, and showing on the down or undercolor of the feathers. The barring is somewhat smaller on the hackle and saddle feathers than on other portions of the body. The bird is of medium size with broad neck, flat at the shoulders, the breast is full, and the body broad and compact medium size wings that fold gracefully, the points being well covered with breast and saddle feathers ; a medium sized head, ornamental with upright, bright red comb and wattles ; a large, bright eye ; and yellow beak legs and toes gives a description of the bird in its entirely. The difference between the barred and the Peacomb barred is that the latter has a small, firm and even peacomb instead of single comb. (I believe the peacomb variety was left out of the American standard when it was revised last time. I fail to see any good reason for so doing). For the farmer or marketman the barred are the favorite, being of medium size, well proportioned, with a deep full breast making a most admirable bird for market purpose. They are hardy, mature early, good layers the year round, and in winter they lay exceptionally well. Their eggs are brown in color and average 8 to the pound. They are good sitters and excellent mothers.

The barred Plymouth Rock, besides being a practical fowl, is also one of the most sought after by fanciers. No class is better filled at the average poultry show of the country than is this. The graceful figure, upright carriage, and active nature endear it to all as a fancier's fowl. There is a fascination in breeding it for plumage, the more regular and even the barring the better. It requires much skill to breed for color, and two matings are generally used. An established rule for mating for cockerels is to use a standard-color male with medium-dark females, and for pullets use light

(1) *Pit-game,* means the breed used for the horrid practice of cock fighting. ED..

male and dark females. The double mating is resorted to by many, yet I have seen rare specimens produced from single matings.

The characteristics of the Barred Plymouth Rock are noticeable in the other varieties of the Plymouth Rocks, excepting that of color. The size, shape, general outlines, and qualities are the same in the other varieties as in the Barred. The White Plymouth Rock is pure white in plumage throughout, and the Buff variety is a clear Buff uniform in shade, except the tail, which is a deep buff or coffinsh-yellow brown. The buff should extended to the under color as much as possible. The standard weight of cocks is 9½ pounds; hens 7½ pounds, cockerels 8 pounds; and pullets, 6½ pounds.

My next article will be about the Wyandottes.

S. J. ANDRES.

TEMPERATURE AND MOISTURE IN ARTIFICIAL INCUBATION.

Having in a former article given reasons for chicks dying in the shell and having been often asked for informations on the above subject, I give the readers of the JOURNAL my manner of procedure. I am using at present a hot air incubator F. first at to the setting and turning of the eggs.

The first essential for a good hatch is *fresh*, fertile eggs. Eggs three weeks old, if properly taken care of, that is, kept in moist, coolairy places, set on end, and turned every day, will hatch well, but not so well as fresh ones.

Eggs in the incubator may be tested after the fifth day and infertile ones removed. Put whatever number you want to hatch at a time. They cannot be incubated successfully by adding them at different times in any machine. Place the eggs in the trays in full rows with the large ends all pointing the same way. In turning, place extra trays over eggs; grasp the side of the trays firmly and turn end over end, allowing the large end of the eggs to pass downward and underneath.

This method always leaves the eggs in the proper position, that is, with the small ends the lower. They will nearly always be left in proper position if the above method of turning is followed: Turn the eggs smoothly and gently; every day or so change the trays from one section to the other.

Temperature.

The proper temperature is 103° for either hen or duck eggs, the entire time of incubation, at or near the centre of the egg. While 103° during the entire hatch has given the best hatch any temperature, between 104° and 105° will produce good results.

Any temperature over 106° is injurious, and if continued any length of time will kill the eggs. Although a temperature of 110° for two hours will not kill the hatch, it will greatly injure it. Low temperature on the contrary, will not kill, but it will greatly prolong the hatch and make the chicks weak.

The thermometer should be from two to four rows from the front of the tray, facing outward so as to be easily seen from the outside without opening the doors of the machine The importance of placing the bulb of the thermometer on good fertile eggs must not be overlooked, and for this reason the eggs should be tested out. I have given an illustration of the tester I have use in a former article. It is a very good one. I have often tested eggs by holding the egg in the left hand and shading the egg with the right hand, using a candle instead of a lamp. Many operators fail to test at all, and never pay any attention to this very important subject. The thermometer will run from two to three degrees higher on good fertile eggs than it will on those are not fertile, because the one that are hatching contain animal heat and the thermometer placed on these eggs will at once run higher than when placed on infertile or dead eggs. For instance, when you place the bulb of the thermometer shows a temperature of 103° degrees while the eggs that are hatching will probably show a temperature of 106° and get overheated without the operator knowing it. (1) For this reason extreme care should be taken to get the thermometer upon live fertile eggs. Now I take up the subject of

Moisture.

The amount of moisture given is always indicated by the size of the air-cell. To see the cell, use the tester. Moisture is the rock on which many incubators have gone to pieces.

The moisture or air saturation is affected by the size of the opening of the ventilators. A wide opening of the ventilators will reduce the moisture; a small opening will increase the moisture.

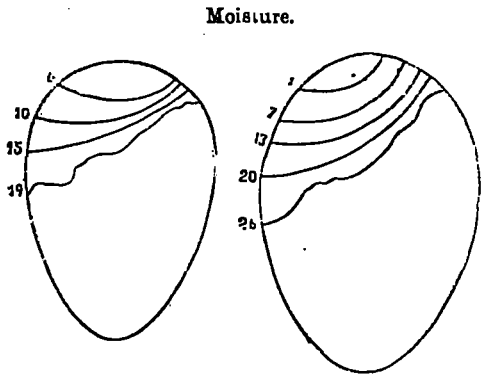
(1) Cannot make out the meaning of the sentence. ED.

With a wide opening the air moves through the machine rapidly and carries the moisture out, while with a small opening the current moves slowly, hence there will be less drying down propensities.

Use your egg tester quite frequently and do not be afraid that it will hurt your eggs to test them, or at least a part of them every other night or so after the first test.

It is not necessary to examine all of them at each test but just look at enough to show you the amount of air-cell you are getting. After the first or second hatch you will not need to test so often, as you will learn about the amount of ventilating you should have at the different stages of incubation in order to gain good results. To illustrate the point and make it plainer, please study the diagram of eggs here shown.

For instance test your eggs on the fifth day removing all that are not fertile, and note your air-cell. If it is as shown in diagram, you may know that you do not need to close your ventilators any in the least, but on the tenth day when you test if you note that you have more air-cell than is shown in the diagram, then you can com-



Hen Egg. Duck Egg.

mence closing the ventilators a little. This will retard the circulation of fresh, warm air through the machine hence your eggs will not dry down so rapidly. It would be well to test them on the 15th day, watching the air-cell. If it is about the same as the diagram you will not need moisture, but on the other hand should you note you had too much moisture, then close your incubator a little more than one-half and leave them so until the 18th day. Should you add moisture at that time put it in one pan only, and that pan at the lamp end at the machine, the one farthest from the lamp, but in case you do not have too much air-cell, even on the 18th day, do not add any moisture. You will have to be guided entirely by the air-cell in the egg. Hence, no moisture is required sometimes the entire batch. In case you have no moisture in the pans, when the chicks begin to pip and come out nice and wet, do not add any moisture at all. If, on the other hand, you see that they are coming out dry, and stripping on the eggs becoming dry then open the doors and add the moisture at that time.

S. J. ANDRES.

BYE PRODUCTS ON A FARM.

A few years ago a leading statesman found himself—in what to men of his standing is not an infrequent dilemma—in the position, that he had to make a speech. The speech had to be on farm topics, for the occasion was agricultural. He ventured to suggest that—being not far from a densely populated town—his hearers might do worse than set themselves to produce at least some fruit: and that to be sure of being able to market it, and get the best price for it, they should combine to preserve it, so that it should keep, and that it might be sent to great distances. This not altogether unreasonable suggestion was transmuted into the assertion: "The farmers are being advised to give up grain growing, and meat production, and turn their attention to jam-making." I have ventured to quote this story, because it illustrates a danger against which all agricultural writers have to contend. The class they address is not, as a rule, addicted to very close examination of terms. They prefer to speak as to the impression produced upon them by a speech or article, than to ascertain what the speaker or writer really intended to convey. As a consequence, when one takes the liberty to advise, the advice is not always construed in the right way.

I do not take upon myself to propose that any section of occupiers of land should give up producing anything which they are at the present minute bringing into the market. I do however recommend that—in order to make the most of everything they grow—the leading occupiers in every district should combine to set up among themselves places and appliances where the rougher produce of the farm may be utilized and made fit for sale. No

class in the world has, hitherto, been so unaccustomed to create a market for themselves as the farmer. The idea has been that the function of the producer ended with producing: and that how to convert his produce into money to the *very best advantage* might be left to the dealer and the middle man. I am certain that—supposing the intermediary buying of hay for export, grain for the miller, and beasts for the butcher, to be necessary—there are many departments of farm produce for which no agency of conversion as yet exists: or is likely to do, until the land occupiers themselves provide one.

For very many reasons, straw and rough grass are capable of being employed to better uses than as the mere bedding for cattle. Rough paper can be made, and rough mill boards, if machinery, capital, and ingenuity be brought to bear upon the task. But no individual can do this: it requires associated efforts. If a combine of farmers were to deliver potato tops and the covering of the corn cobs to a central depot, there is not the least doubt but that a market for them would soon be shown: and here is a "tip" for a middle man. In the country, there is often abundance of clean water and bright atmosphere, both of which are necessary for some manufacturing purposes, but the raw material which could be manufactured goes to waste, because no one will take the trouble to organize a means of regularly utilizing it.

Nor are the straws and stems the only part of farm produce which might be turned to account by combination among growers. Not only do all varieties of fruit require special measures to prevent the ill effects of a glut on the market, and to ensure preservation until the consumers take it off, but there are certainly new crops which might be grown—not in exclusion of older selections, but in addition to those—if only there were an opportunity made for placing them. It may be taken as settled that so long as the bounty system prevails upon the European Continent sugar beet can never be produced elsewhere at a profit. The sum given per cwt. to the foreign grower will always enable him to undersell the home grower who has nothing to rely on but market prices. It seems certain that were the means provided, more than one pleasant beverage could be made from farm produce which now yields little or nothing. The demand for cider is capable of being increased indefinitely, were as much pains taken to produce a wholesome and palatable article as was taken to make Burton beer a success and the foundation of millionaire fortunes and untold misfortunes. As much money will one day be made by the ingenious inventor who shall turn to real account the juice of orchard fruit (why not of turnips?) as non alcoholic drinks, the residue being consumed as cattle provender where grown. A thirsty town population clamours for wholesome summer drinks, and if vegetable juices will not produce them better chemical mixtures, the preconceived idea of the natural order of things is very much at fault. Why must it remain a settlement that our drinks—to any extent—in Canada end with wine, beer, and cider, and that no new beverages can ever again be devised, and these of a more suitable character?

It seems to be settled that the slaughter of all farm stock can be conducted—so as to utilize bye products—more effectively in centres to which supplies of live beasts can be sent every day all the year round, and not in country places, to which, of necessity, the supply will be intermittent.

But the same rule does not apply to such bulky produce as those from which beverages might be made and fibre adapted. The sources of civilization, it was once said, are not exhausted, nor are the limits of ingenious adaptations of waste substances yet reached. Two factors are required to make the most of these, combination among producers and far reaching, free-ranging thought. There is no doubt but that, in those countries where practised, the old method of cultivating land and restricting the cropping to as few varieties as possible has had a most prejudicial effect upon the residents. The same class which in the States takes out patents by the score, in Canada rarely invents anything; and the want of ingenuity, which fails to devise new means of utilizing farm produce, is a more dangerous barrenness even than is the want of readiness to devise plans for the saving of labour. W. R. GILBERT.

AGRICULTURAL EDUCATION.

It is only of late years that any special training was considered necessary for the skilful, scientific, and profitable, duties of farm life. Every art has been looked upon as more technical and intricate, and yet there is none which involves so great an amount or variety of purely scientific principles, or such systematic pains taking and observation,

nor is there an occupation which permits of a liberal education being turned to a more excellent practical account.

Happily, the remark that we had teachers of Oratory, Rhetoric, Music, Drawing but not Agriculture is not applicable at the present day, but the necessity of sound Agricultural education is becoming more apparent as progress in that direction is being made. In all civilized countries Agricultural Colleges, Institutes, Model-farms and lecture bureaux are established, and every man who proposes that his son should be a farmer ought to take advantage of them and see that his educatfon is as complete as if he was going to be a Clergyman, a Doctor or a Lawyer.

The above applies to the young, but farmers who did not have the advantage of special training in their youth, may in many instances, improve their knowledge and general qualification by intercourse with persons better informed than themselves, and copying their good examples; by observing the experiments, and their results at the Model-farm, by watching the proceedings and assisting at the meetings of the farmers' clubs and agricultural societies. A farmer can learn, something to his advantage even from the failures of himself and his neighbours, and although he may possess a fair acquaintance with all the principles of the art; and can assign a scientific reason for his operations, will yet find his deficiency occasionally, and should never cease being a student.

It is not enough that a young person who wishes to learn farming should be a mere onlooker, he should spend a good deal of time on the farm and learn, in a practical manner, not only how the various operations are performed, but how to perform them, so that when necessity comes he can instruct others, and judge when work is properly done.

He must learn to obey so that he can command. He must labor so that he can know what is a fair days work.

He must take his part to know the economical principles of the division of labor.

Practical farming, without a correct knowledge of theory is like a ship sailing without a chart or compass, and theoretical farming is like trying to make her go without sails or rudder.

Schools.—The rudiments of agriculture are now taught in many of our common schools and this is as it should be for whether a child is intended for a city or a country life, a knowledge of the simple principles upon which this most noble science is founded cannot fail to be useful, if it only leads the youthful mind to contemplate the beautiful, the goodness of the Great Creator, and the means by which His gifts can be turned to good account by man.

And it is not in the rural districts only, where it will be an advantage to the community to teach agriculture, for if we can imbue the minds of our city bred youths with the fact that farming is a science in which they can show proficiency as well as in any trade or profession, and that, properly conducted, it can be made profitable, we shall induce some to take it up as a means of making a respectable and honest living, and thus the congested state of the trade centres will, in some measure, be relieved.

Neither need agricultural instruction be confined to the male sex; it will do a girl no harm to acquire some knowledge of the subject, under any circumstances, and should she have the happiness to become the wife of a good farmer, she may be invaluable to him in the way of consultation and advice, and will be able to see if things are going right.

Two heads are better than one, even if they are sheep's heads; knowledge is power, unity is strength and the man is to be pitied who will not listen to the advice of a faithful, loving wife whose interests are identical with his own.

No time is lost in the study of agriculture and horticulture, either as regards our temporal welfare, or the advancement of the higher attainments of intellectual and spiritual truth.

J. B. Boivin,
Teacher.

OBSTACLES TO AGRICULTURAL PROGRESS.

Ignorance. — Lack of intelligence on the part of such as cannot take a comprehensive view of first principles, and have not sufficient curiosity to make themselves acquainted with the best practices, and this thoroughly, remembering that "a little learning is a dangerous thing."

Scoffing at novel systems or processes instead of studying and adopting them as soon as their usefulness is confirmed.

Guessing. — A farmer should do nothing by guess. Does the physician guess the nature of his patients malady? Does the apothicary guess

the ingredients necessary to compose the healing draught? Does the mathematician or the navigator guess?

Rules are absolute, with few exceptions, and are infallible guides, but guesses are often prejudiced by preconceived ideas as to results.

Want of capital. — A man's farm should be regulated in extent by the capital at his command, but it will be well here to note of what capital consists. Time is capital. So his farm should at least be large enough to employ all his time. Brains are capital. Integrity, perseverance, forethought, determination, constant application, and energy are all capital as well as money. While one man would succeed with a small amount of cash, another will fail because he did not possess the other elements of capital.

Land in which the water stagnates should either be avoided or thoroughly drained, after which it will frequently be found to be the most productive.

Distance from market—The farmers in the vicinity of large towns, where there is a retail market for their products, and where manure can easily be obtained, can make a success of mixed farming or market gardening, but when he is at a distance from these advantages, he should turn his attention to pastoral farming and depend upon the products of his animals who will consume the crops raised, and leave a considerable portion on the land in the manure, while at the same time his marketable commodities will be concentrated and the cost of freight to the market reduced.

Bad roads.— Besides being a public obligation, it is a farmer's interest and duty to see that the roads are in good condition, as they will otherwise prove an obstacle to his success in the extra work they will give his horses and the wear and tare of his vehicles and harness.

Bad fences, are serious obstacles to successful farming and must be avoided; it is unneighbourly and injust to others not to keep good fences, and a waste of time to be continually cottering at a poor fence.

It will always pay to make a good one and never allow it to get out of condition by neglect.

Bad laws. — It is the duty of every farmer to pay some attention to government and municipal affairs, not to spend too much of his time in politics, but to take sufficient interest in them to see that good laws are enacted and duly administered, and to use his franchise honestly and as a sacred right, remembering that however small his influence may be it should ever be used in the cause of equity and justice.

Idleness and inattention to business— The successful farmer is never idle. Careless and listlesness are unpardonable in a farmer; recreation is necessary but it is not idleness. On a farm there is always something which demands attention and requires a man to be continually on the alert or perhaps the season for certain operation may pass and a whole year be lost.

Want of business ability is a misfortune which should be overcome. There are times when a farmer is required to possess a certain amount of business tact in the purchase and sale of stock and produce, and if he feels his deficiency in this respect he should try to improve himself by practice, and do nothing without well weighing the transaction, and avoid foolish bargain by due consideration and advice. *Swopping*, which many farmers are so fond of, should be avoided, for generally speaking both parties to a swop think they are going to have the best of the bargain.

Swine.

BUTTERMILK FOR SWINE

Buttermilk, is handled promptly, is one of the very best feeds for swine. The mild lactic acid at churning time, or shortly after, probably improves buttermilk as a feed for pigs, for only a little of the sugar is broken up to form the acid. The lactic acid in the milk renders it palatable, and seems to have a favorable action on the digestive tract. Since buttermilk is rich in protein, corn is a supplementary food, and probably the most economical substance to feed with it. Shorts and middlings are likewise satisfactory, but hardly as economical. Since these two are rich in protein, the feeder is supplying rather too much of that costly element for the most economical returns. Bran is bulky, chaff-like food that is not satisfactory for youngs pigs, but which may be used with older animals, especially where the feed is not heavy and it is desirable to give volume to the feed. In some cases buttermilk is held in filthy vessels at the creameries, and in those still worse at the farm. When this product undergoes a putrefactive fermentation, it should not be used even for pig-feeding.—Prof. W. A. Henry.

PIG FEEDING IN THE SOUTH OF IRELAND

The Bacon Curers' Association of Ireland, which comprises the leading firms in the trade at Cork, Limerick and Waterford, are now distributing all over Munster well-bred Yorkshire boars, that are calculated to greatly improve the breed of pigs raised by farmers in the Southern provinces. These boars have been obtained at considerable expense from the best herds in England, for the purpose of infusing, in due time, new blood into Irish bred swine, so that the progeny will be most likely to suit the requirements of the bacon trade as far as the raw material is concerned. In connection with the maintenance and proper development of the Irish bacon industry, a much better class of animal than those usually raised throughout Munster is urgently needed hence the object in view in importing the best bred boars that could be obtained from England, and their distribution amongst the farmers of the South. A number of inspectors have been appointed, whose business it is to travel through the Province of Munster, placing the boars at centres where most required, and at the same time to diffuse the most reliable information to farmers and others interested in the matter, as to the best method of raising pigs suitable for the Irish bacon trade of the future.—*N.-W. Farmer.*

SPRAYING TURNIPS WITH PARAFFIN

Can you or any of your readers inform me the proportions of paraffin and water for spraying turnips to prevent fly ?—W. M. [Paraffin oil and water do not mix, and a mechanical contrivance for blending the two immediately before application is necessary. For garden turnips and brassica seedlings we have obtained successful results in bad attacks of turnip "fly" or flea-beetle with paraffin oil at the rate of half a pint per two gallons of water. A constant churning of the liquid is necessary to secure a uniform distribution of the oil. On the farm this method is impossible with ordinary appliances. We hope to test an American sprayer shortly in which the oil and water are emulsified in the nozzle at the point of discharge. By this machine the proportion of oil can be varied at will from 5 to 30 per cent. With ordinary spraying appliances it is necessary to use a paraffin soap emulsion in which the oil is permanently emulsified. A wide sweep of spray is necessary if the sprayer be drawn by horse-traction, owing to the agile movements of the flea. Paraffin washes only kill *by contact*, and it is necessary to wet the insects to destroy them. We have recently tested an emulsion used by a friend in Herefordshire which is cheap and effective in use, but rather dangerous to make. Place just enough water in a copper to cover the bottom and then add a firkin (64 lb.) of soft soap ; stir and heat until the soap has melted ; heat three gallons of paraffin oil in a separate vessel until nearly boiling and pour into the melted soap ; stir until mixed ; apply at the rate of 1 gallon of the mixture to 40 gallons of water. A second recipe which we have tested in the course of some experiments on paraffin washes is worth mention as yielding a sound lathering emulsion of good killing power :—Boil a firkin of soap in 2½ gallons of water ; when the soap has dissolved add 3 quarts of turpentine ; stir and then add 2 gallons of paraffin oil ; stir until mixed. No fire heat is needed after the turps have been added. Dissolve at the rate of 1 gallon in 40 gallons of water, and apply in the form of a fine spray.—H. H. Cousins, M. A.]

A LITTER OF SEVENTEEN

A Treherne correspondent writes : "Not very long ago a certain farmer (names either of persons or places I will not mention) was boasting that a sow of his had just given birth to seventeen pigs, all doing well, and that he had hit two on the head, as the seventeen were too many for her. He had another sow that he expected to have pigs, and could not make out why she had not had them. A few days after he hit two more of the pigs on the head. Scarcely had he done so when a neighbor called in and took a look at the sows. "Well," said he, "I should think that other sow has had pigs and has gone dry, and the pigs have got through that hole into the other pen." So the farmer owned that that was most probable, as he was certain the both sows were due about the same time. This though perhaps incredible, is a positive fact."—*N.-W. Farmer.*