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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

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Journal of Agriculture and Horticulture

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

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The Farm.

NOTES BY THE WAY.

Prof. Shutt's report.

(Dec. 1, 1899.)

As we often hear it recommended to sow clovers, especially lucerne, without any grain-crop, for fear of lessening the yield of the grain, we are glad to have Professor Shutt's authority in favor of the universal practice of the old country. Speaking of a sample of cultivated soil, sent for analysis from Notre-Dame, Kent Co., N. B., Mr. Shutt says: "The economic improvement of this soil demands first of all the addition of organic manure. As in all probability there would not be sufficient farmyard dung to bring up the land, recourse must be had to turning in green-crops, preferably clover. The crop from 8 to 10 pounds of clover-seed, which may be sown with any of the cereals without diminishing the yield of grain, will enrich the land, if ploughed in the fall, to an extent equal in many respects to a dressing of 8 to 10 tons of ordinary farmyard manure." It is a pity farmers will not grow rape and feed off with sheep. A very trifling dose of nitrate of soda with 300 lbs., of a good mineral superphosphate, would bring a crop of rape, which being fed off by sheep, each sheep getting a pint of oats and pease, a day, would work a wonderful change in the land under treatment, and if the second-crop of clover were consumed in the same way, the whole face of the farm in which these things were put into practice would be entirely altered in less than 8 years.

Mr. Shutt lays the average losses of farmyard dung by water at from one-third to one-half, or even more, of its original value. To avoid this, he proposes: 1, to cut the straw used for litter, and thus increase its absorbent power; 2, to use air-dried muck, when it can be had. To which, of course, Mr. Shutt adds that clover ploughed in will greatly benefit the soil, as no doubt it will, and a good practice it is if the farmer has no stock that would be glad of it in the winter. Ploughing in buckwheat or white mustard is one thing; ploughing in such a valuable fodder-crop as clover, is another.

Tannery-ashes.—The finest crop of tobacco we ever grew was manured with spent ashes, and waste from a tannery at Joliette; some of the leaves, as measured by M. Panneton, the Grand Connétable of that town, were upwards of 40 inches long and more than 24 inches broad; Connecticut seedleaf; not good to smoke but decidedly profitable; people came from as far off as 20 miles to see it.

Wood-ashes.—Some one mentioned that, in his opinion—who it was we forget—it was not likely that a dressing of wood-ashes would bring a crop of turnips. We had spoken of having succeeded in growing white turnips in England with this manure alone. Now, just look at Prof. Shutt's analysis:

The analysis of a sample of wood-ashes forwarded by Messrs. Reford & Co., Montreal, showed their composition to be as follows:

Moisture	2.26
Loss on ignition (charcoal, &c) .	5.62
Insoluble matter (clay, sand, &c.)	17.36
Phosphoric acid	2.21
Potash	6.22

Commercial wood-ashes necessarily vary somewhat in composition; but good samples should range between 5% and 6% potash, and 1-5 per cent to 2-5 per cent phosphoric acid. It is evident, therefore, that this sample may be regarded as quite equal to the standard of good commercial grades.

Thus, a dose of 25 bushels of ashes of the above quality would contain a fair amount of phosphoric acid; quite enough to bring a crop of white turnips, for allowing the ashes to weigh 75 lbs. a bushel, they would contain 41 lbs. of phosphoric acid, about the same quantity as would be contained in the ordinary dose of 300 lbs. of good mineral superphosphate; thousands of acres of turnips are grown every year in England for sheep with no other dressing than that.

The experiments of Nitragin, a preparation containing the germs resident in the roots of legumes, with a view to ascertaining its practical value for encouraging the growth of clover, pease, and beans, have been continued at the Experiment Farm.

The clover experiment failed, as the nitragin arrived too late in the season of 1899; but very satisfactory conclusions were reached in the "treated and untreated" clover-plots of 1898, that is, on the second year's growth.

The soil was almost pure sand, humus and nitrogen being present only in excessively small quantities. Ten square yards were manured with 4 oz. muriate of potash, and 12 oz of superphosphate, i.e., at the rate of 120 lbs. of muriate of potash and 300 lbs. of superphosphate to the acre.

FIRST YEAR'S CROP, 1898.

The yield of the crop from inoculated seed was about 15% heavier than that from the untreated seed.

SECOND YEAR'S GROWTH, 1899.

	Inoculated.	Untreated.
Total weight of plants . . .	745 grms.	252 grms.

Mr. Shutt concludes with the following piece of practical advice:

There are, however, several rather serious difficulties in the way of the general introduction of nitragin. First, it must be used while still freshly prepared (the German manufacturers will not guarantee its vitality after it has been made six weeks), and, secondly, it must have been protected from strong light and kept at a temperature below 100° F.

We are of the opinion that any farmer might without purchasing nitragin obtain the same results by taking soil from a field that has grown a good crop of clover and sowing it over the poorer soil. The earth which comes from the roots of clover contains the germs and, therefore, this method would be an actual inoculation of the poorer soil. This plan has worked most successfully with several experimenters, in both Europe and America. Another plan would be to pour

cold water over the earth (previously placed in a barrel) from the rich clover land and after allowing the soil to settle, to pour off the supernatant water and soak in it the seed about to be sown.

Americanisms.—Will any one be good enough to translate into intelligible English the following sentence, taken from an article, by a learned professor, in "The New-England Homestead."?

I. Pastures heavily grown to weeds and thistles capable of plowing after the unwanted growths have been cut and burned, should be put in some strong-growing annual."

The same article states that the writer "fed over 1½ steers and cows on an acre of pasture sowed to eight varieties of grass." We should like to know how long he fed them, as we reckon, in England, that it takes 3 acres of the best meadow and pasture to keep a milch-cow for 12 months.

The potato crop.— We have just received, in the "N. E. Homestead" a report of the estimated yield of the potato-crop of the United States and Canada. We say *estimated*, because it is impossible that an accurate computation of the yield can have been arrived at so early in the season as the 1st October. However, the probability is that the crop, as returned, has not been underrated, so we will take it as proved, in the following observations.

1. The crop of 1900, yielded, in the United States, 83 bushels to the acre all over. Now 83 multiplied by 60 (the weight in the United States per bushel in pounds) is equal to 4,980 which divided by 56 (the English weight) is equal to 89, or, as the yield of potatoes is usually calculated in Britain, to 2½ (gross) tons to the acre. The average yield of the crop in England is, taking one year with another, about 5½ tons, or 210 bushels American measurement.

Canada shows a little better return for labour, manure, and seed, her crop being given this year as 104 bushels an acre, or 6,240 pounds, about 2.8 tons to the acre; but how comes it that Quebec's crop beats Ontario's yield by 29 x 60, 1740 pounds to the acre? The figures stand thus in the report:

Quebec	110 bushels.
Ontario	81 bushels.

And why should P. E. Island yield 150 bushels an acre—a really fair crop of 4 tons imperial measure and weight when Manitoba and B. Columbia only give 125 bushels each?

The last four years' average yield of the Dominion reads thus: 104, 108, 94, 104 $= \frac{410}{4} = 102\frac{1}{2}$.

The last four years of the American average, thus: 83, 82, 73 64 $= \frac{302}{4} = 75\frac{1}{2}$, not two tons (gross) to the acre.

We are driven to one of two conclusions: Either the farming of the United States, in spite of the numerous Agricultural Colleges, etc., must be in a very primitive condition, or the climate, soil, etc., of that extensive country must be inimical to the production of an esculent that owes its origin to the same hemisphere in which it now refuses to compensate the grower for his outlay.

Judging from the frontispice of the New-E.-Homestead, entitled "Digging and Harvesting Potatoes in Maine"; the crop therein portrayed would be above 80 or 90 tons, at least, to the acre! What earthly good can be derived from such ridiculous exaggerations?

GROWING MORE GRASS.

Professor Roberts of the Cornel Experiment Station says that the pastures and meadows which have been injured by the drought the past year should be renovated this fall, that they may produce more grass next year, instead of growing only weeds which will come in where grass roots have been injured or killed. He advises sowing the pastures with a mixture of two pounds timothy seed and one pound each of orchard grass, meadow fescue and redrop per acre. This will be enough as many of the old grass roots will remain, only the most tender being destroyed. Harrow two or three times with a spike tooth harrow with very small and very sharp teeth, to break some of the old grass roots and induce them to start anew, and also to cover the seed. When the seed is sown put on 50 pounds of muriate of potash and 50 pounds of nitrate of soda per acre, or double that amount if the soil has been tested and proven to respond well to these fertilizers. Then roll to press the earth down on the seeds. Early in the spring sow one pound of white clover seed and two pounds of alsike clover per acre. Sell off the poorer cows, that the pasture may not be taxed too heavily next year. With all this we agree, excepting that we would not use nitrate of soda in the fall. If used in August or early September it would give grass a good start, but later than that we would defer its use until the clover was

sown in the spring. We would also in New-England substitute two pounds of Northern red clover seed for the alsike, and add two pounds of blue grass to the fall seed if it was for pasture, unless we felt confidence that there was enough there that had resisted the drought. Old meadows may be improved in a similar way, but we would not use the blue grass seed on them or the white clover, but would put on at least five pounds of red clover, and think ten would be better, and five pounds of the orchard grass. This should make a good hay. One hundred pounds per acre of acid phosphate might be used to advantage.

American Cultivator.

Note by the Editor of J. of Ag.—We have often tried, and still more frequently seen others try, to restore worn-out pastures, but never have we seen the attempt succeed by using the means suggested in the above. A dressing of pond-mud, ditch-scrapings, &c., mixed with lime, and turned over once or twice, applied in the fall, at the rate of 40 bushels of lime to the acre with 4 loads of the earthy material, we have found wonderfully effective in bringing up the clovers, particularly the white-clover. When the grain has failed altogether in patches, we should prefer breaking-up the pasture and re-seeding it anew after proper cultivation has brought the land into tune again.

As for spreading nitrate of soda in the fall, that is clearly wrong; if it is used at all, it should be spread in the spring as a top-dressing. Always use potash dressing in the fall, and nitrate of soda and sulphate of ammonia in the spring.

Mangels are, we hope, all in the root-house or cellar by this time. Nothing is gained by leaving them standing too late as all the gain they make in the latter part of October is principally composed of water. Swedes can stand a great deal of frost without suffering in quality, and parsnips may remain in the ground all the winter, though digging them up in the spring, on heavy land particularly, makes a horrid mess. Why do people persist in eating parsnips in the early autumn? We saw them in the shops, this year, in September! Parsnips are never fit to eat till there has been a good hard frost. In England we seldom cook them till February.

Seed.—The best crop of fall-wheat we ever grew was seeded at the rate of one bushel to the acre; but the land was full of manure, and the cultivation was intense; one harrowing, two rollings (Crosskill and Smooth), and one horse hoeing. But on ordinary land, with spring seeding, we recommend 2½ bushels of wheat, 2½ of barley or even 3, and 3½ of oats, to begin with; say, the last week in April; increasing the dose by half a bushel every fortnight to the end of the season. (1)

PLOUGHING MATCHES AND PLOUGHING.

In spite of the continued rain which fell on the 16th of October, no less than 30 ploughmen competed in the contest held on that day by the Agricultural Society of St. Hyacinthe county. The attendance was not as large as it might have been, had the weather been more favorable, and the work not perhaps as good as if the ploughmen's patience had not been submitted to a severe test by the rain and the cold weather; yet, taking all things into consideration, the match was a success upon which the society deserves to be congratulated.

Among the contests which agricultural societies open to their members' ploughing matches are certainly of the best, and it is much to be hoped that they will become of more frequent occurrence in the future. Too much importance cannot be attached to good ploughing. Straight furrows of the right depth, width, and degree of inclination, not only speak much in favor of the farmer, but as the physical condition of the soil depends in a large measure upon the perfection of the ploughing, they have a large influence upon the yield of the crop.

In order to do good ploughing, as well as to do any work, not only skill but also good tools are required. We are now far from the day when the crooked branch of a tree was used for tearing up the bosom of the earth, which then made up by its fertility for the lack of proper tillage. To day we find no less than several hundred types of ploughs adapted to all kinds of soils and conditions, but the progress from the primitive type to the perfected one was very slow. Before Jethro Tull began to demonstrate the importance of the thorough tillage of the soil, about the middle of the eighteenth century, the plough was yet very imperfect, and it was only since then that the attention of thoughtful men was drawn towards

(1) More on this subject next No. Ed.

its amelioration in order to render it more effective. The large number of coulters attached to the Berkshire plow then in use was gradually reduced as experiments proved that the division of the soil by concussion was a more economical and quicker way of pulverising it than by the use of coulters which required a much larger amount of force. Hence the adoption of wider mouldboards, accompanied by a single coulter, when practical men perceived that narrow and straight furrows, though pleasing to the eye, could not be called good plowing.

Yet, too often the real aim of the plough which should be not only to overturn the soil but to pulverise it as much as possible, is overlooked by ploughmen, and imperfect implements are too often still made use of. We have the authority of Prof. Roberts for saying that "in America, plowing is the least understood and the most imperfectly performed of any operation of preparing the land for crops. In Europe, it is still worse. The Englishman does little more than two things with the plow—inverts the furrow and makes it straight. All the tillage has to be done by following implements." (But it is perfectly done. ED).

The plough with the coulter is not always an economical implement. Experiments made in order to determine the amount of draught required by each part of the plough shows that that the severing or cutting of the furrow slice by the coulter requires 55% of the total draft consumed by the plough, while only 12% are spent in turning it, and the 33% remaining by the friction of the sole and the land slide. This is when the furrow slice is simply inverted by the plough and, consequently, the greater part of the tillage has to be done by other implements But the plough should do more. It should as much as possible break up and disintegrate the furrow slice, leaving the land in as corrugated a condition as possible, which, quoting from Roberts, "allows the implements of tillage to take hold of the crest of the furrows, and break and fine them without disturbing the sod". These conditions are secured by the use of the *jointr* or *skim-plough* in the place of the coulter, which cuts a miniature furrow in advance of the plough, and leaves the mouldboard, which should be as bold and as overhanging as possible, to do the rest of the work. In this way, the amount of draught used, though no greater than in the first case, produces more effective work. The furrow slice, instead of being simply overturned and left at an acute angle, almost untouched, is much more corrugated, the plants are also far better covered, and subsequent tillage more economically accomplished. (1)

Heavy clay soils however require a different mode of treatment. As in such soils we wish especially to secure the action of the frost as deep as possible in the soil, as well as the percolation of rain water, furrows left at an acute angle and imperfectly fined, such as are made with use of the coulter will answer the purpose better. In all other soils however the use of the skim-plough with a wider mouldboard seems more rational, as it not only does part of the tillage which heretofore was left to the implements following, but also greatly facilitates the work of the latter.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

The public at large will doubtless rejoice at the crusade that is being waged against the atrocious pointed-toed, high-heeled boots and shoes. So much has the reaction for reform set in, that many shops are selling out their old stock at half the original price, just to get rid of them, and stock themselves with those suitable to the present demand.

People, who had long slender feet, could wear without injury to themselves the pointed-toed boot or shoe, while others with short feet had the greatest difficulty in getting shoes suitable to them, often having to endure much pinching before the boot or shoe could be brought to comform kindly to the comfort of the feet.

There are people, no doubt, who will be sorry to lose the extra inch or so in height the heels gave them; but they will never be brought to acknowledge how much harm has been done to their feet during their use. It makes one shudder to think of the tortures some poor girls must have endured; standing all day in a shop "breaking in" a pair of those torturing foot-coverings.

They, at least, with many others, will rejoice at the change that has caused these abominations to be consigned to oblivion.

(1) The skim (not skin) plough is not used in place of the coulter but precedes it, and turns down to the bottom of the furrow all the rubbish, grass, etc, growing on the 2 or 3 inches of the furrow on the land side. ED.

The devotees of the pointed-toes and high heels will undoubtedly cling to them as long as they can get them, but even they in the end will have to give way to the demands of fashion.

Another badly needed reform has just set in : about skirts. Women need no longer sweep the streets with their nice dresses ; these are consigned to their proper sphere, that is, the house, and to those who drive. Nothing is more graceful looking than a medium train to a house-dress, it gives a certain dignity to a short person and lends a charm to all in the ball room, its legitimate kingdom.

Sensible walking skirts are now made just long enough not to touch the ground, and give the wearer free hands for umbrella or parcels.

If some people could see themselves clutching a handful of skirt on one side to keep it from harm while the other side is doing the scavenger's work, they would be amazed at the figure they cut in the streets, and never wonder at passers by looking at them in wonder. Far less injury would be done in many cases if the dress were left entirely alone.

As long as there are people of means willing to pay for and carry out any new fad that the ingenious mind can invent, there will be those willing to pander to the same. It often happens that the active mind of one person, will hit upon a valuable suggestion, or change, which will bring them in a small fortune, and it is this hope that it is ever working and ready to grasp at anything which will conduce to their own profit, and also prove useful to the public at large. One has only to look round and notice the vast improvements made by the ingenuity of man during the last fifty years some of which are so wonderful that the mind can scarcely grasp them. Then again fall back on many little things, small in themselves, but which add greatly to the help and comfort of the work and workers.

In fact there are inventive minds ever on the alert to help and show the world at large the easiest way to pick up a living.

COOKING.

POTTED HEAD.

Clean half an ox-head and a cow-heel, soak in salt and water, then rinse, cut in pieces, put all into a stewpan, cover with cold water, and bring very slowly to the boil, carefully removing all scum as it rises. Add two whole onions stuck with twenty cloves, two carrots cut in thick slices a table-spoonful of whole allspice, two blades of mace, two tablespoonfuls of peppercorns, a bunch of herbs, and a little salt. Let all simmer together for about six hours till the meat is very tender, then strain all through a sieve ; let the stock remain till quite cold, then remove the fat fromits surface. Cut the meat off the head and foot into small pieces, and do not let any spices, vegetables or bits of bone remain with it ; add to it the stock and let it boil for about fifteen minutes. Season to taste. Have ready some wet basins or plain moulds garnished with slices of hard-boiled eggs. Carefully place some of the meat in them, and fill up with the liquor ; let it remain until quite cold and turn out on a dish nicely garnished.

A ham should be put over the fire in cold water, after being well scrubbed with a vegetable brush, to remove any particle of dust, and perhaps the too strong smoky odor. Then fifteen minutes' moderate boilling should be allowed to every pound. The flesh shrinking away from the bone also indicates that the ham is well cooked. The water should be changed to cold water again two or three times if the ham is very salt, or too strongly flavored. When done, allow to cool in the water in which it as been boiled. This is the secret of juiciness and tenderness.

If, when cooking, a saucepan or fish-kettle springs a leak, drop a small piece of bread into it, and it will at once find its way to the hole and stop the leaking.

EGG SAUCE

Boil three eggs hard. Make half a pint of smooth, well-made melted butter. Remove the shell from the eggs and cut them into thick rounds and then into dice-shaped pieces. Give the eggs one stir in the saucepan, and pour the remainder into a hot tureen. Season with pepper, salt, and nutmeg.

POTATO SOUP.

Boil three pounds of potatoes in two quarts of white stock, with a stick of celery, a turnip, and two onions cut in slices. Season with white pepper and salt, and boil till the potatoes are quite

tender. Then mash them smoothly, pass the soup through a sieve, adding a little milk or more stok if it is too thick ; return to the saucepan to get quite hot, and serve with dice of fried bread and grated cheese.

TOMATO PICKLE.

A delicious tomato pickle can be made as foltows :—Take fourteen pounds of green tomatoes and six large onions ; slice them all, sprinkle with a cupful of salt, and let them stand till next day. Then drain them and add two quarts of water and one quart of vinegar. Boil for fifteen minutes, and then drain again, throwing away the liquor. Add two quarts of fresh vinegar, two pounds of sugar, an ounce each of cloves, whole ginger, allspice, mustard and cinnamon, and a saltspoonful ol cayenne pepper. Tie the spices up in a muslin bag. Boil for fifteen minutes ; pour into earthenware or glass jars, and tie down when cold.

THE BEDROOM.

In order to sleep well it is necessary that the surroundings be suitable. The room should be large and airy, and if not large the ventilation should be good. Often, on noticing the close air of a bedroom, one has wondered how the occupant could sleep at all in such an atmosphere ; but so many people have a prejndice against night air that they seal themselves up in a room to which no air can gain access. Breathing over and over again the same air, it is little short of a miracle that they are not asphyxiated before morning. The air should not blow directly upon one when he or she is asleep ; and if the room is small a screen can be placed in such a position as to prevent this. Even a draught is preferable to vitiated air in the sleeping room. The bed should be comfortable and roomy. By comfortable is not meant soft. It is a mistake to get accustomed to too soft a bed, for when one has to spend a night away the comfort of it will be so much missed as to banish sleep. The bed should be smooth and level, not much higher at the head than at the foot, and not inclining the other way to send the blood to the brain. It makes a difference, too, what kind of a pillow one has. It is better to use a small pillow which can be moulded into any shape, and that the head should not be high. It is liable to make one round-shouldered to sleep with the head too high.

EARLY TO BED.

A long sleep, says an American doctor, rests the mind as well as the body, and prepares one for the work of the next day, whatever it may be Far better than an opiate or a narcotic is the habit of seeking the pillow at an early hour, and quietly lying still with closed eyes and relaxed limbs, until sleep, gently wooed, comes with its healing touch and softly weaves its spells of halm,

Growing children cannot too carefully be enjoined to get plenty of sleep. The boy or girl who has lessons to learn must waken early after a good night's rest and this is ensured only by punctuality in retiring. (1) Eight o'clock is a good bedtime for all young people under fifteen, and should be insisted upon by parents.

Ammoniated chalk will take out grease spots, and fullers' earth mixed to a paste with ammonia and water has much the same effect. Make the paste rather thick, lay it on the spots, leave till dry, and brush off with a clean brush. Fullers' earth mixed with water only can be used to take grease spots out of the most delicate silks without injuring them.

Fill dirty saucepans with hot soda water till there is time to wash them. This means a great saving of time in the end.

To remove the smell of onions from a saucepan fill with cold water, and put in a slice of bread—a stale crust will do — and boil for half an hour. The odour will have entirely disappeared.

When the woodwork of a window is painted it often happens that splashes of paint go on the glass, and if these are left for any length of time they become hard, and many people find them difficult to remove. There need, however, be no difficulty if soda and water be used. Take some very hot water, and in it dissolve a lump of soda ; a piece about the size of an egg to one pint of water. Wet a soft cloth or piece of flannel in this and rub the paint marks, when they will be found to come off quite easily.

(1) I "go to bed" ; an American "retires!" Ed.

The Garden and Orchard.

(Conducted by Mr. Geo. Moore).

THE APPLE-CROP IN NEW-ENGLAND.

The weather in the early summer was cool and showery however as the season advanced it became warmer and dry, favoring the development of the apple crop. The trees were laden with fruit many of which were blown off by a severe storm and lost; nevertheless plenty were left to make the crop above the average.

Now is the season for gathering and storing them, and it would scarcely be possible to have finer weather for the purpose. In orchards where the trees have been properly cared for and sprayed, the fruit is large, sound and fair.

HOPEDALE, MASS.

Take care of the shade trees.

The Draper Manufacturing Company is one of the richest and most energetic firms in the New England States And not only is its business carried on in the works, where there are now upwards of 3 000 men employed in making all kinds of cotton machinery, on the strictest business principles, but the same method is adopted in the management of the town affairs. The roads are all in perfect condition, shade-trees are planted on all the principles thoroughfares and these are all in the most luxuriant state of growth, the result of the care they receive. The elms, and such trees as are liable to the attacks of insects, have all had their bark carefully scraped and been sprayed, hence they are delightful objects to behold, clean and thrifty, and show that attention to these details well repays the outlay.

THE GARDENER A PHILANTHROPIST.

A well kept and well used garden makes its owner a philanthropist, it gives him the means to minister to the necessities and comforts of his less fortunate neighbours, and to share with them the advantages and pleasures he derives from it. A lover of a garden can scarcely fail to be a lover of mankind, for no selfish person enjoy the beauties of Nature half so well has one who shares the enjoyment with others. A writer on the subject aptly says: "One of the dearest privileges of a garden is the power of bestowal it affords. Flowers and fruit are always gratefully received, and have always been considered among the best means of expressing kindness, sympathy and love."

INSECTS INJURIOUS TO VEGETATION.

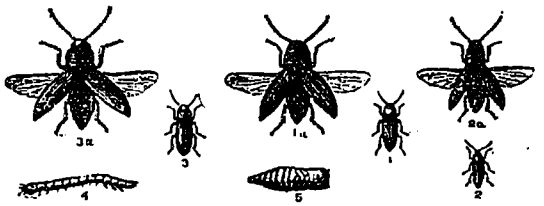
(Continued).

Wireworms.

Wireworms are more to be dreaded than most other insects, because scarcely any crop is free from their ravages.

Corn, roots. and vegetables of all kinds suffer; they feed at all seasons of the year, except during very bad frosts, and then they go down deep into the ground. As they live from three to five years in the wireworm stage of their existence their work of destruction is of long duration.

WIREWORMS.



1 and 1*a*. *Agriotes lineatus.* } (Natural size and
2 and 2*a*. *Agriotes sputator.* } magnified).
3 and 3*a*. *Agriotes obscurus.* }
4 Larva of *Agriotes lineatus.* } (Natural size).
5 Pupa. }

The beetle which produces the wireworm is called the "click" beetle, because when held by one end it bends its body and produces a clicking sound, or when placed on its back it jumps up and makes a peculiar click.

Methods of Prevention and Remedies.

From the experiments made at Cornell University it is concluded that it is almost impossible to extirpate wireworms by any of the means there adopted.

Protecting the seeds by coatings of Paris green, tar, etc., or soaking them in solution of lime, copperas, coal oil, turpentine, and strychnine had no effect in preventing the attack, or killing the pests.

Attempts to starve them out by fallowing the land or cultivating crops supposed to be distasteful to them, as for instance, mustard, was equally

ineffective, and farmers were advised not to lose the use of the land for a season, and the labour necessary to keep it free from vegetation, in the hope that they must starve out the wireworms. The sowing of buckwheat and mustard, supposed to be the special aversion of wireworms, was also tried without any satisfactory results whatever.

In the same series of experiments, kerosene oil solution made of one part of oil to 20 parts of water, was sprayed on soil in a cage containing 25 wireworms. The solution was made to penetrate the soil by frequent sprayings. Though this process was effective to some extent, it could not be profitably applied on a large scale. The cost would be great, as 1,000 gallons of oil would be required per acre, and this would have to be driven into the soil by frequent sprayings.

Bi-sulphide of carbon, as used against the phylloxera, killed wireworms, but as it would require 1,000 lbs. of the liquid per acre, it would only be practicable and profitable to employ this on limited areas and for very valuable crops.

In extremely bad and persistent wireworm infestations of hop land, it might be desirable to try bi-sulphide of carbon, but, owing to its explosive nature, it must be very carefully handled. It could be applied close to the "hills" or plant centres, with the instrument known as the *pal* (1) *Gastine*, resembling a large auger, or borer, which is worked into the earth close to the stocks. In the upper part of this instrument there is a cylindrical case to contain the bi-sulphide of carbon. Upon pressing a spring into this cylinder an exact dose of the insecticide is injected into the hole made by the borer. In the vineyards where this process is employed, the dose varies from one quarter to half an ounce of bi-sulphide of carbon injected in two or three places near each vine-stock.

In order to destroy wireworms with salt, it would seem that it must be applied at the rate of 10 tons per acre, and this would be practically destructive to vegetation. Lime applied to the rate of 200 bushels per acre, and gas lime at the rate of 20,000 lbs, per acre, did not extirpate wireworms in the Cornell experiments referred to above.

Although "traps" were tried at Cornell without very conclusive results, it is to be noted that "traps" of rape cake, mangel-wurzel, potato, carrot, and turnip have been found of great value; in hop land, for instance, where almost the only way to get rid of wireworms is by placing pieces of these roots, or of rape cake, close round the hills or plant-centres.

These traps of mangel, potato, or rape cake should be placed close to the hills or plant-centres about four or five inches below the surface, and examined once or twice a week, and the wireworms taken out and destroyed. The traps should be continued during the spring and summer, and up to the winter in badly infested hop land, as the wireworms only go down deep into the ground when frost comes, and the traps will be more likely to be attractive when the hop plants are not putting forth shoots.

As it is rather difficult to find the "traps," white wooden skewers with points and thick heads might be advantageously used in the case of mangel, potato, turnip, and carrot traps, to show where they are, and to enable them to be pulled easily from the earth.

There is no doubt that wireworms have been encouraged in hop land by the quantities of rape "dust," or ground rape cake, put on for manure, so that in infested fields it would be well not to use rape cake as a manure for some years.

Rape dust sown broadcast on wheat, oats, barley, and other crops infested with wireworms, at the rate of from 5 to 7 cwt. per acre, has frequently been the means of saving the crop, as the wireworms are attracted by the smell of the rape dust and feed upon it in preference to the corn crops, while these grow away from their attacks in the meantime.

When old pasture is converted to hop land it would be well to burn the turf, in order to destroy the wireworms. Ploughing it in deeply will be of no avail whatever, and liming or gas-liming, unless it is done on a very liberal scale, will not be of much use.

Land known to be infested should not be kept down to seeds too long, and sheep should be heavily folded on the land and the herbage kept closely fed off before it is ploughed. When it is ploughed, the land should be pressed in order to make a firm seed bed.

In turnips, mangels, and grass the presence of wireworms is often not apparent, and remains undetected. A winter fallow is desirable after a bad attack in wheat, oat, and barley crops, in which damage is plain and manifest. In this

(1) So in the original; what the words really are is a mystery. Ed.

case the land should be cultivated immediately after harvest and moved constantly, so that nothing may grow. Early in the spring the ground should be stirred again and vetches sown, of which wireworms do not seem to be very fond.

Good, clean, and deep cultivation checks the spread of wireworms. In Vol. XIV., 1st series, of the Journal of the Royal Agricultural Society of England, in the course of an essay on the farming of light land, which is always more liable to the attacks of wireworm than heavy soils, a case is quoted of a farm in the neighbourhood of Guildford, kept perfectly clean by deep ploughing and the unsparing use of horse and hand hoes, where the root and corn crops are stated to have been uninjured by wireworms; the owner asserting that he starved them out by allowing no weeds to grow to sustain them in the absence of a crop.

For wheat attacked by wireworms, it is desirable to roll the land as early as possible in the spring with a ring roller, (2) after putting on 30 or 40 bushels of soot per acre, or 25 bushels of soot and 10 bushels of lime well mixed. From 1½ to 2 cwt of nitrate of soda per acre would stimulate growth and force the plants away from the wireworms. Rolling should also be repeated: driving sheep over the crop is also useful. Making the soil solid keeps the insects from attacking the roots.

Stimulating the plants of oats and barley with nitrate of soda or sulphate of ammonia has a good effect. Five to seven hundred-weights of rape cake may be sown broadcast, to entice the wireworms where the crop is severely infested.

Grass seeds for pasture should be sown with wheat, oats or barley on land supposed to be infested, as the corn will attract the wireworms until the grasses are established.

Rolling meadow lands with a heavy roller is beneficial.

Folding sheep on grass land, feeding them with swedes or mangels, is a most valuable remedy. Weeds should be kept down so as not to afford a shelter to the beetles.

Many birds devour wireworms eagerly and should therefore be encouraged.

(2) A "Cambridge" ring-roller is not so effective as "Crosskill's clod-crusher," double rolling with which we found most effective in the spring 1849. Ed.

THE VALUE OF SALADS

Americans who visit Europe almost universally notice the absence of fruit which is so abundant and delicious in their own land. Even grapes are hard to get and costly in the markets of France. To a large extent the abundant use of vegetables in Europe makes up for the scarcity of fruit in the daily menu of the people. It is perhaps for the lack of this kind of food, together with the large consumption of meat, which the abundant use of fruit cannot entirely neutralize, that Americans are known as a bilious race.

According to an old author, "Salads refresh without exciting, and make people younger"; and however skeptical we may be as to the latter clause, we must agree that nothing is more refreshing to the eye and palate, on a hot, breathless day, than the dainty bowl heaped with the luscious, cool green (1) of lettuce or other salad plant.

The name "salad" means salt, and was given to indicate the principal seasoning of the dish, though it might well have been used to designate the physical properties of the plant itself, as it is a well-known hygienic fact that the uncooked green vegetable contains a large proportion of mineral substance—potash, soda, etc.

All these favorable comments apply, of course, to properly-nade salads. Such a mixture of cold potato, poor oil, high seasoning as sometimes is dignified by the name of "potato salad" is not meant.

The plants commonly used for salads are celery and lettuce, but as the season for the former practically ends in April, we depend for summer salad mainly upon lettuce. The botanical name of lettuce—lactucarium—was given because of its milky sap. The plant was introduced from Holland in 1520, and has been widely used as a salad, and to some extent medicinally. It possesses a slightly sedative quality resembling opium, but less active.

(1) We prefer the interior blanched leaves or heart. Ed.

The Dairy.

COMPETITION OF DAIRY-PRODUCTS.

Held at Quebec Ottawa 6th, 1900.

List of Winners.

CHEESE.

1. Adélard Hamel, Sainte-Croix, Lotbinière: 97½ marks, silver-medal, first-class diploma, and $10 00 in mony.

2. Joseph Emile Pelletier, Martin, Beauce: 97½ marks, silver-medal, first-class diploma, and $9.00 in money.

2. J. L. G. Marduff, Egypte-de-Milton, Shefford; 97 marks, silver-medal, first-class diploma, and $9.00 in money.

3. J. P. Mireau, St-Tite, Champlain: 94½ marks, bronze-medal, second-class diploma, and $4.00 in money.

3. Joseph Pairon, N. D. de Laterrière, Chicoutimi: 94½ marks, bronze-medal, second-class diploma, and $4.00 in money.

4. Eugène Michel, St-Patrick's Hill, Arthabaska; bronze-medal, second-class diploma, and $3 00 in money.

4. Louis Bibeau, St-Flavien, Lotbinière: 94 marks, bronze-medal, second-class diploma, and $3.00 in money.

4. Odillon Michel, St Féréol, Montmorency: 94 marks, second-class diploma, and $3.00 in money.

4. Théophile Lévesque, Old Lake Road, Témiscouata: 94 marks, bronze-medal, and $3 00 in money.

5. Isidore St-Pierre, Noxton Pond, Shefford: 53½ marks, bronze-medal, second-class diploma and $2.00 in money.

Twenty-five competitors took part in this competition.

Judges: MM. J. A. Vaillancourt, Montreal, and J. A. Plamondon, St-Hyacinthe.

BUTTER

List of Winners.

1. Didace Kironac, St-Narcisse, Lotbinièfe: 98 marks, silver-medal, first-class diploma, and $11.00 in money.

2. J. E. Z. Marchand, Ste-Anne-de-la-Parade, 98 marks, silver-medal, first-class diploma, and $9.00 in money.

3. Pierre Bisson, St Sylvestre, East Lotbinière: 95 marks, bronze-medal, second-class diploma, and $5.00 in money.

4. Eugène Métinier, St-Patrice-de-Blannivage: 94 marks, bronze medal, second-class diploma, and $4.00 in money.

Twenty-one competitors took part in this competition.

Judges: MM. Jos. Emond, Quebec, and J. D. Leclerc, Ste Thérèse de Blainville.

CHEDDAR CHEESE

(Continued)

During 1897, the acidity of the curd was frequently estimated by at least two methods, and in addition many experiments were made.

It was now found that the quantity of acid that appears to be present in the curd depends very largely upon the way in which the method adopted for its estimation was carried out.

The results by any process depend primarily upon the quantity of water with which the curd is diluted before estimated the acidity. This is seen in the following experiments. Two grammes of curd were finely minced and 25 c.c. water added, the acidity indicated was ·75 per cent.; 2 grammes of the same finely minced curd when treated with 100 c.c. water showed only ·65 per cent acidity.

A similar result is obtained if the curd is ground into a paste with water before the estimation of acidity. Thus 2 grammes of curd were ground up in a mortar with 50 c.c. water, and showed an acidity of 1·00 per cent, while two grammes of this curd when ground up with 100 c.c. water showed only ·80 per cent of acidity. Numerous experiments were made upon this point, quantities of water varying from 25 c.c. to 150 c c. being used, and always with the same varying results.

The most feasible explanation of these variations is that the alkaline solution of soda with which the estimation is made acts upon the casein itself when in a finely divided state, and that this action diminishes with the increasing dilution of the solution. The results also depend on the fineness of the curd. In order that there should be no doubt about this, three experiments were made with the same curd, 2 grammes being taken in each case. One portion was ground as finely as possible, the second not quite so finely, and

the third roughly. The acidities obtained were 1·35 per cent., 1·15 per cent., and 1·00 per cent, respectively, which prove that the action of the soda depends on the finenes of the curd. Similar fluctuations were found when estimating the "casein acidity" by treatment with soda method "*d*," the results also varying with the quantity of soda taken, and with the temperature to which the solution was heated. Some experiments were also made to test the effect upon the estimation of lactic acid, boiled, and the excess of unneutralised soda estimatee; that which had been neutralised represented the "casein acidity."

All the figures given in the following tables were obtained in this way, and represent the acidities in terms of lactic acid (percentages).

Acidity of the curd at Different Stages in the Manufacture of the Cheeses.—This has been estimated on three occasions, and the results are given in the following table:—

Acidity of Curd at Different Stages.—Percentage, as Lactic Acid.

Stage in Manufacture.	Curd of May 13, 1897			Curd of July 20, 1897			Curd of Sept. 22, 1897		
	In liquid draining from Curd.	In Curd soluble in water.	In Curd when treated with Soda (Casein acidity).	In liquid draining from Curd.	In Curd soluble in water.	In Curd when treated with Soda (Casein acidity).	In liquid draining from Curd.	In Curd soluble in water.	In Curd when treated with Soda (Casein acidity).
After taken to cooler	·39	...	...	·51	...	...	·38	...	...
After 1st cutting	·58	·75	3·60	·69	·75	3·40	·53	.75	3·40
After 2nd cutting	·78	1·10	3·70	·85	·90	3·50	·77	.90	3·35
After 1st turning	·93	1·25	3·70	·96	1·15	3·50	·86	1·00	3·50
After 2ud turning	1·04	1·40	3·75	...	...	...	·98	1·05	3·45
After grinding	1·02	1·40	3·80	1·02	1·35	3·70	·90	·90	3·45

using indicators other than phenol-phthalein. The results were rather remarkable. With methyl-orange as indicator, the curd, instead of showing an acid reaction, now showed an alkaline. It was very evident, in face of these results, that if the determination of the acidity of the curd had to be made or was likely to throw any light upon the problems of cheese-making, the acidities must be estimated daily in precisely the same way.

The following methods were therefore fixed upon in order to obtain uniform results, but as there is no standard by which to ensure their accuracy, they cannot be looked upon as being more accurate than any other methods. For the estimation of the acidity soluble in water, 2 grammes of curd were taken, rubbed up in a mortar with a small quantity of water, and made up to 30 c.c. For the estimation of casein acidity, 2 grammes were taken, minced very fine, transferred to a large test tube with 15 c.c. soda solution, each c.c. of which would neutralise 0.01

A careful study of these figures shows that both the acidity of the liquid draining from the curd, and the water soluble acidity of the curd itself, increase rapidly during the manufacture of the cheese, but there is no corresponding increase in the acidity of the curd.

The acidity soluble in water is due mainly to the lactic acid present in the curd. The casein acidity is remarkable for its coustancy. One would expert it to rise simultaneously with the rise in acidity of the liquid from curd. But it does not.

There can be little doubt as to the important practical lesson to be learnt from these figures, namely, that the acidity of the curds affords no indication of the progress in manufacture, while the acidity of the liquid draining from the curd undoubtedly affords a very distinct guide to the condition of the curd itself.

(*To be continued*).

THE DAIRY EXHIBIT AT THE BATH AND WEST OF ENGLAND SHOW.

ED. HOARD'S DAIRYMAN : — This Agricultural show, which is exceeded in the Kingdom only by the Royal, has just concluded a five day's exhibition. Since it is held in one of the principal dairy districts of England, it is not surprising that the dairy interests, were well represented.

The butter exhibit consisted of 126 entries, which were divided into five classes—the prize for each class amounting to $50, making $250 in premiums on butter alone. Since most of the butter in this section is made in farm dairies, the entries in all but one of the classes consisted of three one pound prints. Each print was placed on a piece of white porcelain, six inches square. These were arranged on two very long tables which had been covered with earth and sown thickly with grass seed ten days previous, the grass being about one inch high, thus giving the tables a beautiful green, velvety appearance. This in contrast with the yellow butter and white plates made the most pleasing butter exhibit we have ever had the privilege of seeing.

The cheese exhibit was large and the cheese of excellent quality. It was divided into six classes in which there were 130 entries and $560 given in premiums.

The most attractive part of the dairy exhibit was the working dairy, which was located in a large building erected for the purpose and accommodated forty hand churns and butter workers. It this building could be seen dairy work of some kind in progress at all times during the show. Separating, pasteurizing and cooling milk occupied the morning hours, and later each day two buttermaking competitions for prizes by dairymaids took place. These contests were well filled, and revealed many excellent butter makers.

There was a milking contest each afternoon which was rather a novel feature and created a good deal of interest. Each contestant was required to milk five cows.

Dealers in dairy apparatus and machinery had many fine stands. This was an interesting part of the show, for both the separators and untensils used here are quite different from ours.

Dairy stock was well represented by 147 Jerseys and 71 Guernseys, there being many excellent specimens of each breed.

M. J. FRASER,
Illinois Agricultural Experiment Station.

WESTERN DAIRYMEN.

Sub-Earth Ducts.

In discussing this subject Mr. J. N. Paget, Canboro, pointed out that, while the sub-earth duct was an excellent means of controlling the temperature, it would not do so in all kinds of curing-rooms. The curing-room needs to be constructed so that no air will get in except through the duct. With a properly insulated room, the air can be kept at or below 65° by a sub-earth duct. He then described a duct put into his factory last season. It was 150 feet long, and at a depth of 6 1-2 feet below the surface. The drain was filled with seven 5 inch tiles. At the outer end of the drain a cistern was built of brick, 3 feet across. On top of this a 35-foot air tube built of wood was erected, 3 feet wide at the base and 20 inches at the top. On top of this tube a cowl was placed, with a mouth 3 1-2 feet across face, and with a large fan so that it would swing round with the wind. The drain entered a stone box under the buildind, which extended a foot above the floot in the curing-room. The warm air outlet in the curing-room was on the opposite side of the room from that on which the drain entered. The total cost was about $80.

In the discussion on this paper, Prof. Dean stated that there were only four factories in Ontario in which there were sub-earth ducts. These were giving good satisfaction. The duct does not cause mould. Moisture is very favorable for the growth of mould, but does not produce it. At the Lyons factory the duct was made of two

10 inch tile, with a few turned tile to take the place of the cisterns at the ends of drain. On August 15th the temperature in the curing-room of this factory was 64° while in the sun it was 90°, and in the shade 78°. The essential points in a sub-earth duct , were an intake pipe high enough to reach above any buildings or trees near by ; a cowl with a wide mouth and a sail that would make it respond quickly to the wind. Length of drain should e at leats 100 feet, and the depth 6 feet. There was a saving in shrinkage and butter fat, and an improvement in quality valued at 1-4c. to 1-2c. per lb. of cheese, by having a sub-earth duct.

The Poultry-Yard.

(CONDUCTED BY S. J. ANDRES).

THE INCUBATOR ON THE FARM.

Preface to article in the Agricultural Gazette N. S. W. by S. J. Andres.

We sometimes wonder why it is that farmers' wives are so slow to avail themselves of the new and improved method of poultry culture. A few years ago, the hatching of chicks by the aid of incubators was but an experiment, now it is a settled fact. Why should we not have new machinery and improved methods for rearing chicks as well as everything on the farm ? The up-to-date farmer of to-day is satisfied with nothing less than a sulky plow which turns from two to three furrows at once.

The sickle, the cradle, and the flail are so far forgotten that the children of to-day do not know what they look like. The self-binder, with its sheaf-carrier, makes easy work for the harvesters. The mower, rake, and hay loaders, the press-drills, the disc-harrow, the corn-planter, the steam-thresher, the feed-grinder and cooker, and even the machine for building fences, make farming almost play compared with 50 years ago. But the march of improvements does not stop out of doors. In the house we find the washing-machine, sewing-machine, patent churn, the new and improved ranges, carpet-sweeper, and new and improved vessels of many kinds for the preparing of food. With all the improvements the farmer's wife still depends on the fussy old hen to hatch and rear her poultry.

Perhaps it is the question of finance that keeps many from investing in an incubator. It does seem a considerable sum of money to invest in a setting-hen ; but let me tell you, sister farmers' wives, if you will stop a moment and consider the increase of the profits you will soon see the advantage of an incubator over broody hens. In the first place the farmer's wife generally has all she can do in the spring without attending to the wants of sitting hens. She is ambitious to raise all the chicks she can and often over-works herself to do so. Now, 15 minutes night and morning are sufficient to cool and air the eggs, fill and trim the lamp of a 200 egg-incubator, and the rest of the day it cares for itself. Care and labor are saved. There is no breakage of eggs, no leaving the nest to let the eggs get cold and spoil the hatch.

At the end of three weeks you have at least from 125 to 150 fine chicks all of one age to commence business. The outlay for oil with which to heat the machine has been much less than the feed for enough old hens to hatch that number of chicks, even if every hen attended strictly to business, therefore, you have saved on the food.

The foregoing article was written in the hope of inducing the readers of both the French and English Journal to take more interest in artificial incubation.

An article published in the *Agricultural Gazette*, New South Wales, has been sent me to revise and comment upon. The article is a good one and worthy of being published in full. I take the liberty of adding some remarks which I hope will be of interest to our readers and also hope to continue the subject in later numbers.

Faithfully yours,

S. J. ANDRES.

The Hatching Season.

J. J. McCUE.

Each year finds the poultry-industry getting further and further away from the old methods ; especially is this the case with incubation. The natural method of incubation is superseded by incubators, of all makes and sizes, from the "Ban-

tam" of a dozen eggs up to "Incubator houses" of 25 to 30,000 eggs. The poultry-industry of modern times has called in the aid of artificial methods for incubation, the old-time broody hen being used only in a small way. In using the hen the rate of increasing numbers is too slow; besides, we cannot get broody hens early in the season, when we wish to incubate early eggs, to produce early layers. Another serious drawback with a hen early in the season, and at other times, is, that she often forgets to return to the nest, breaks an odd egg, and never forgets to hand down her legacy of vermin to her children.

With incubators, we seldom find them neglecting the eggs, if we attend to their food—oil. We are certain they will go broody for us at any time, if we supply the heat and attend to their requirements. We are also certain that the chickens hatched will be perfectly free from vermin of all kinds. Another point in favour of incubators is the easy management of the chicks—100 incubator chicks are as easily attended to as ten with a hen. It would require eight hens at least to properly care for 100 chickens, which would mean eight separate lots to water, feed, and attend to. Then there is the risk of one hen's chickens getting into another hen's coop, and the result is usually a wounded chick, or a dead one.

Incubators.

There are several kinds of incubators, and if you follow the majority of circulars issued with each machine, you will read: "If instructions are carefully followed, the machine will hatch 100 per cent. of chicks." Well, sometimes an incubator does give a percentage of 100 chicks, but it "spells" a long time before it tries to do it again. One hundred per cent. hatches are accidents—not the regular percentage at all. A hen, the surest incubator, seldom gives a hundred per cent. The man or woman who runs an incubator from June till December, and averages 75 per cent., has proved that the fertility of eggs was good, that the machine was good, and that the person who ran the machine was good, and no novice at artificial incubation.

In choosing an incubator, beginners in poultry-breeding have much to contend with. They cannot really choose or realise which make is the best; they generally depend on a friend's advice, or upon catalogues that state 100 per cent. hatches, if you use their machine. There are several makes of good incubators, and to secure one of these a fair price must be paid; the cheap machines cannot have the proper timber and other required parts that are used in the fair price machines. A cheap machine means cheap timber, cheap pipes, cheap lamps, cheap regulators, and last a greater consumption of oil than the fair-priced machine.

There are incubators that give good percentages, but when compared with other makes, equal in percentage of chicks, they fail in the cost of running the hatch. I am using machines that cost twice as much for oil as other machines alongside them. A good incubator should heat the eggs in as cheap a manner as possible, and be regulated so that there will be as little variation as possible. It should be built honestly; all materials used should be of the proper kind and of best quality; all joints, soldering, &c., should be done in a true workmanlike manner. It should be so constructed that a constant supply of fresh warm air can be passing through and round the egg-drawer, at the same time keeping up a true, even temperature. The machine should show no variation in temperature in any part of the egg-drawer. Another point, the system of regulating the machine, should be simple and accurate, for this is one of the most important parts of an incubator. An incubator should be raised some distance from the floor of the room. A fair height is to have the egg-drawer 2 ft. 6 in. or 3 feet from the floor. Never place an incubator in a stuffy corner of a room, or in draughts; an incubator, to give good results, must have a free circulation of pure air—not draughty—all round it Before placing an egg in the incubator the owner or attendant should see that it is perfectly level and firm; there must be no rocking or shaking in the machine when you take out or replace the egg-drawer.

ABOUT COLOR IN LEGS OF POULTRY.

Over in England they do not share our ideas about yellow legs. In this country and also in the United States the originators of new breeds are pretty sure to boast of the yellow legs, in England the yellow leg is almost an abomination and birds possessing such undesirable qualities are very difficult to sell. (1) The following extract

(1) The yellow-leg for roasting; the white-leg for boiling. ED.

from the *Rural World* of London, expresses the feeling of English people in regard to yellow legs. "As as already been stated Lincolnshire Buffs are a very good table birds and they lend themselves readily to fattening. A point in their favor in this respect is that the colour of legs is of a whitish pink, hence they are popular with the poulterers, as more money can always be obtained for fowls with light coloured legs, as this means white flesh. Yellow legged birds are almost useless for selling to poulterers, and those with black legs are by no means liked. The quality of the flesh is excellent, being tender and juicy and they make exceedingly good eating. Any one who is going in for poultry for profit, and wishes to keep a breed in which are combined the table and egg producidg qualities, cannot do better than go in for Lincolnshire Buffs."

The above is an extract from an article in which the writer extols the merits of a breed known as Lincolnshire Buffs. It is the same old, old stereotyped claim that has been and still is made for all breeds, but even the black legs are not so objectionable as those that are yellow. He says that "more money can always be obtained for fowls with light colored legs."

In this country says and American writer "there seems to be a preference for fowls with yellow legs, yet the colour of the legs and skin has about as much to do with the quality of the flesh as has the feathered legs of an Asiatic has to do with egg production. There are breeds in this country without yellow legs that cannot be surpassed for the table such as the Dorking, Houdan and Pit Games. The color of the legs do not indicate any desirable characteristic. The preference in that direction is simply one of those customs "fads" that have come to the surface with nothing to recommend it but the fact of its existence. In the meantine the consumers are becoming wiser and after a while the preference will give way and real merit will be considered."

I agree most heartily with my American friend in the point he takes on the color of legs. I speak from personal experience as I have tested the qualities of the three breeds he names. I think the Editor of this journal will bear me out in the Dorking (1) The Dorkings have been and still are popular in England, although have not appeared to do so well in Canada possibly be cause our soil and climate, heavy clay soil and excessive cold, but give the Houdan the favorite flesh bird of Old France, and the American Langthan either white or black an equal chance in care feeding and fattening (I do not wish to leave out the Plymouth Rock, Barred and White, as we can raise them in our Dominion of Canada equal in every respect to the same birds bred and raised in any country or by any skilled poultryman).

And now that Mr. Fisher, the Honorable Minister of Agriculture for the Dominion has taken such pains to forward the interests of the poultrymen and farmers who may if they are willing to take advantage of the facilities offered to them. I firmly believe that the "fad" of color of legs will disappear and our poultrymen will give our neighbors across the line, to use their own expression "a dusty hunt and a hard road to travel" in order to crowd us out of the English market where we now have a good start, which I hope our farmers will not lose for want of the pluck to keep the ball going and give the poultry products as good a reputation as has been done with the dairy products, and work to build up such a foundation for the poultry products of our Dominion as will make our American neighbors talk about us, as they are already doing, for we have given them something to talk about already. Up and at them boys. Hurrah for the old flag and keep it at the mast head. The "Canadian Hen" will help you if you give her a fair chance and square dealing.

S. J. ANDRES.

(1) Certainly he will. ED.

The Grazier and Breeder.

COMMON DISEASES OF FARM ANIMALS.

Diseases of the feet.

Besides the ordinary diseases of the feet resulting from injury, in regard to the immediate consequences of an accident, there are effects of a secondary kind to be apprehended which may prove to be of much more importance than the original injury. Starting from a bruise to the sole of the foot, we may often trace the development of canker, or foul, or foot rot, through a series of perfectly well defined pathological changes.

From the local derangement consequent on a

contusion there is always danger of the infective process extending.

A burn, or a bruise, or any severe injury which damages the tissues may—indeed, generally does,—terminate satisfactorily in the healing of the injured structure. On the other hand, the damaged tissue may undergo changes which cause poisoning of the surrounding parts, and in some cases the transmission of the infected matter along the course of the absorbents to parts at a considerable distance from the point of injury; and in certain cases the entire blood stream may be contaminated by the constant leaking of septic fluids into the lymph spaces, and thence into the minute vessels of the circulatory system. Death in these cases is said to be due to blood poisoning; and it is very well known that the origin of this conditions may be traced back to a bite of a rat or a wound from a rusty nail, or some equally slight damage, which at the time of infliction was looked upon as a matter of no consequence.

In the case of an injury to the sole of the foot of a horse, the ordinary termination is resolution or restoration to health; but sometimes the inflammation does not subside, exudation takes place beneath the horny covering, and the fluid if not set free by an artificial opening, forces its way out at the coronet, at the junction of the hoof with the skin, or through a nail hole when the shoe is removed to search for the cause of lameness.

The fact of the escape of fluid beneath the sole at a point so far above as the coronet, is, in itself, a sign of neglect.

But it must be allowed that in many cases of injury to the foot there are no signs which direct attention to the point of injury; and if it is not even suspected that a horse has trodden upon a stone, or is suffering from the pressure of the nails driven too close to the internal foot in shoeing, it is not probable that a search will be made: and the foot may be poulticed, or treatment for the cure of lameness may be applied to some other parts of the limb, until the appearance of the fluid at some point, such as the coronet or the heels, settles the question as to the exact causes of the lameness. At this time however the information may be too late to enable the attendant to avert serious mischief, because, during the progress of the exudate from the point of origin, to the place of exit, various structural changes may have been effected, which are not easily repaired: viz. the formation of the channels (sinuses), or the establishment of a diseased state of the secreting membrane leading to the formation of abnormal horn, of the soft spongy sort which is described as fungoid growth.

Immediately on the discovery of the conditions above described, steps should be taken as far as possible to repair the injuries which have arisen from the continuance of disease in a part in which it was not known to exist. The shoe should be removed, and the bottom of the foot carefully tested by sufficiently paring the sole to allow it to yield to pressure all over. The application of the thumb, — or if necessary the pincers — to the thinned sole will cause the horse to flinch at the original seat of injury, which must be thoroughly explored by means of a fine curved knife used for the purpose, so that any remaining fluid may escape by an opening at the base of the foot instead of the upper part. In making an opening for this purpose, it is important to avoid removing any considerable portion of horn. A small opening may be made by cutting a flap, the advantage of which is that the opening may be easily closed by a pledget of tow dipped in tar, thus preventing the extension of fungoid growths.

When an opening exists in the coronary ring, it is advisable to apply a solution of carbolic acid, which should be driven in to the sinus with a syringe, and if the solution is seen to flow from the opening in the sole, the treatment should be repeated so long as the passage remain open. The cessation of the flow from the lower opening will indicate that the healing process is proceeding in a satisfactory manner.

Neglected of the precautions suggested will be followed by the continued escape of matter from the sinuses in the coronet, and the formation of other sinuses as the quantity of fluid increases; and the disease is then called *quittor*.

Instead of passing out at the coronet, the exuded fluid may find its way for some distance under the horny sole, and finally escape at the heel, by which time the secreting membrane will have undergone such changes that the new horn secreted exhibits that spongy character which is found in *canker*.

Both these conditions constitute organic diseases which are very difficult to cure, and in some instances resist all kinds of treatment.

Injuries to the foot structure of cattle and sheep commonly lead to important changes, attended with loss of horn and the formation of the charac-

teristic fungoid masses, found in the footrot of sheep, and foul in the feet of cattle; and it may be remarked that when the disease in the foot assumes this character, it is impossible to decide as to the nature of the original injury. For example exactly similar results may follow inflammation of the vascular membrane of the foot, from an attack of foot-and-mouth disease, a puncture from a nail or any other pointed body, or an accidental bruise to any part of the foot, or disease due to the communication of the contagious form of foot-rot in sheep. But it should be added that the growth of fungoid masses never occurs except as the consequence of some neglect; for example: the continued exposure of the animal to the cause of the disease without the adoption of preventive or curative measures

Cattle and sheep are more easily treated for severe forms of foot disease than horses are, chiefly because the removal of the horny covering of the foot is of much less consequence in them. Indeed the operation of cutting off the whole of the hoof horn of the sheep's foot is frequently done by the shepherd in course of what he calls paring the hoofs.

The operation of removing the sole of the foot of the horse in the treatment of canker is a difficult and painful one; and is rarely attempted, although some experienced veterinary surgeons contend that it is the most effectual method of cure.

W. R. GILBERT.

CORRECTIVE INFLUENCES OF FOODSTUFFS.

"I have been reading the second edition of "Feeds and Feeding" and have found almost everything I looked for excepting 'foods as a corrective'. Inclosed you will find a clipping which explains what I mean. I have heard that buckwheat midlings have the same effect and also cotton-seed meal, but have not tried them. As every calf is now kept, excepting the Jersey steer calves, and as many of them are killed fron overkindness in the way of feeding too much corn and skim milk and as many steers are hurt by being fed so they are too loose, it looks to me as though this was a subject of importance, Can you refer to anything in this line ?"

Our correspondent incloses a clipping from an agricultural paper reporting the merits of kafir corn as a stock feed, with one quotation as fellows :

"Kafir corn meal is especially valuable to feed calves raised on skim milk. Its constipating effect offsets the loosening tendency of the milk."

In the glumes which surround the seeds of many varieties of the sorghum there is said to be more or less tannin. Possibly there is some of this principle in the kafir corn seed which may give it a slightly constipating effect. Our correspondent is right in holding cotton seed meal to sometimes have the effect reported. He is also right in considering the subject of the corrective effects of feeds a an important one. In our crude ways of handling feeding stuffs up to the present time this matter has not received the attention it merits.

The writer admits that though his book has not discussed the subject as a separate matter, the beneficial or deleterious effects of feeds have often been mentioned under the several subjects. We all know that linseed oil meal is one of the most beneficial foods that can be given farms animals, aside from its nutritive properties. The albuminous matter in the seeds forms a micilage which is particularly soothing to the digestive canal along which it passes, and the oil itself has a favorable action upon the bowels. Cotton-seed meal seems almost opposite in its effects. While we can and should continue to use it as a feed, we should bear in mind that it is not health-giving in any high degree and would bet, ter be used for fattening cattle or sheep rather than growing them. For pigs it is absolutely dangerous and probably cannot be successfully used with calves. The oat is a grain which is healthful in the highest degree, furnishing nutriment in balanced form and prowing most appetizing with all farm animals. The hulls are injurious to the digestive tract of very young pigs, but these can be easily removed by sieving them from the ground meal. As the animals grow older they can take more and

more of the hulls. For ruminants and horses the hulls are of special advantage in lightening the masticated grain and giving it bulk, so that the feeder does not easily deal out an over-supply. Bran is particularly wholesome and healthful for ruminants, and to a limited degree for the horse; its beneficial effects come, in part at least, from the large amount of mineral matter which it contains, of which substance milk-giving animals stand in particular need. Silage and roots of various kinds are likewise healthful from the standpoint of correctives. During our long winters our stock is usually compelled to live upon dry feed for the most part. At such times an allowance of roots or silage is eagerly and often ravenously eaten by the animals, when the stockman is so provident as to have them available.

The corrective or deleterious influence of feeding stuffs aside from their nutritive properties, is indeed one of great importance. As time goes on and experience and study enlarge our knowledge of these matters it will constitute a branch of much importance when cinsidering the properties of feeding stuffs.—W .A Henry in "Breeder's Gazette."

THE COW IN NOVEMBER.

A dairy cow is to a considerable extent an artificial product. Nature fitted her with an apparatus suitable for the nourishment of her offspring, and man, for his own benefit, has for centuries been more or less skilfully educating her to give much more milk than a calf can make use of and at the same time prolong her milk flow from between four and seven months to double that period. It will depend entirely on his skill and judgment whether the cow he seeks to educate will or will not fulfil the desired end.

This is one of the periods of the year at which the sustained milk flow will depend greatly upon the skill and care with which she is handled. This has been an unusually wet fall, and owing to the backset caused by the drouth of early summer the natural pastures have been doing their best to make up for lost time since the rain came. There has been ample growth, but every watchful dairyman will tell that all milk flow has not been at all proportioned to the apparent richness of the herbage. The grass has very little richness in it, and we know shrewd men who are giving their cows a feed of oat sheaves every night to keep up the quality and flow of the fall milk, which is not up to the value of previous falls. As the season gets on into winter, a feed of chop or bran with a little salt added, and given every night at or after milking will be found to pay. There is bulk enough and to spare on every pasture, but for the sustenance of profitable milk-flow a feed more or less liberal of concentrated food will be a paying investment.

Housing is another very important point. Cattle allowed to lie out all night may keep from losing flesh, but a cow left out in the wet, as too many are, is bound to shrink badly in her milk-flow, and no after care or kindness will bring it back. Then will come the long profitless winter with a lot of strippers instead of a herd of paying cows. On many a farm in this country this neglect of the comfort of the cow causey frightful leaks in the milk-flow and a corresponding emptiness in her owner's pocket, whether he can be made to see it or not. Will you be warned in time to stop this leak before it gets too great for prevention ?—N. W. Farmer.

The Flock

CHARACTERISTICS OF A GOOD FLEECE.

The modern mutton sheep must also be a wool producer. Our future wool supply must come largely from sheep grown primarily for mutton. It is essential, then, that a mutton sheep have a good fleece as well as a good carcass. This combination is both practicable and profitable. It is no longer regarded necessary to grow one sheep for a fleece, another for a carcass,

and another for a lamb. The intelligent flockmaster combines them all in one class Some of the best mutton sheep are producing as profitable fleeces as those kept exclusively for wool, and their lambs are decidedly superior.

One of the first essentials in a good fleece is compactness or density. This quality not only insures a better yield of wool but it affords better protection against storms and indicates a hardier animal, better able to withstand exposure. A close, even, dense fleece with no breaks should cover all parts of the body, including the head.limbs and under parts. The tendency in improvement of the wool-producing qualities of modern breeds has been toward carrying the fleece more completely over the head, face, limbs and lower line. The advantage is not so much in the increased yield of wool grown on these parts, as that is of little consequence, but in the accompanying tendency to a larger and better yield of wool in all parts. A barefaced and barelegged sheep is always a relatively light shearer, says Prof C. F. Curtis in farmers' bulletin 96, and in contrast with this the sheep wooled from "the eyes to the toes" always yields a heavy fleece and the wool is generally of a better quality than from those having a scanty covering.

Fineness, length and strength of fibre are essential qualities in a good fleece that should always have prominent consideration in the selection of breeding stock, as these qualities largely determine the market value. Neglect or undue exposure of the flock, a period of sickness, or anything that induces unthrift and impaired vitality invariably results in diminishing both the length and strength of fibre. Generally, a fleece begins to decline in value and yield after a sheep becomes four years old. Softness and pliancy are to a considerable extent due to the secretions of the skin. A clear pink or yellowish skin is an indication of a good quality of wool, while a pale or blush skin is generally accompanied by an inferior fleece. The yolk is the oily secretion which gives color, softness, pliancy and lustre to the fleece. The composition of the yolk consists of a soapy matter, principally animal oil and potash, which promotes the growth of the fleece and prevents friction, wearing of the fibres and cotting. Good feeding, (1) shelter and care promote liberal secretion of yolk, while exposure and alkali soils result in injury to wool by diminishing the yolk.

A liberal secretion of yolk is favorable to the production of a good fleece, but the yolk should be clear and transparent and not too thick and gummy. In addition to these qualities, a fleece should possess the properties of evenness and uniformity; this refers to covering density and quality.—"N. W. Farmer."

MANAGING THE BREEDING SHEEP.

Have you selected your ram and breeding ewes yet? You cannot begin too soon for on the next two months' management of both your next year's lamb crop will very much depend. The live stock oracles, if consulted, will frequently warn you against excessive fat gathered in bunches like those on an over-fed cow. But the every-day sheep man knows that the risk of error is usually in the other direction, with the ewe especially. We sold a 2-year-old ram a little time ago to a cute old sheepowner, who found him afterwards all that he wished as a breeder. That ram fed along with cattle and was firm fleshed, active and full of vitalilty, hence his success. A ewe that has borne two good lambs is the best to breed from again, and the great thing to be aimed at before she is again mated is to have her all the time on feed that will bring her up to the best condition, such as ripe dry land grass pasture, with the held of a bite of bran and chop, seasoned with a pinch of salt. This means the best possible accumulation of physical vigor and that kind of ewe will winter well, turn out good strong lambs and nurse them satisfactorily.

Successful sheepman like to have their

(1) Especially, *regular* feeding, from year's end to year's end. Ed.

ewes in a gaining condition when they take the ram. They are more likely to hold; there will be more twins and fewer mishaps.—"N. W. Farmer."

What constitutes a good sheep? asks Prof. Curtiss, in his recent bulletin. First, he says, let there be pronounced masculinity in the male and femininity in the female. Sheep should be neither sexless nor characterless. They should bear the stamp and character of the breed they represent. This breed character is a mark of good blood and it should be manifest in an unmistakable manner. The sire should be impressive, resolute and of noble bearing. He should be distinctly the head of recognized pure-blood associations in the United States, Canada and other countries warrant its success. Efforts will be made to secure the attendance of buyers from all of the South American republics, in one of which recently over $13,000 was paid for an English thoroughbred bull. Representation will be asked from all the cattle, sheep and hog record associations in Europe. Germany has already pledged representatives, and it need not occasion surprise if a number of the best animals offered at the sale are taken to other countries. The South American trade which rightfully belongs to the breeders of this country can be secured by such efforts as this. Besides, the presence of representatives of other governments will do much to remove what prejudices now exist against American beef, mutton and pork, and thereby enhance values throughout this country.

Buyers from all parts of the world, and especially from every State in the Union will be present at the sales will be made an important part of the Exposition. Feeders and breeders all over the country urged by the management of the International Live Stock Exposition to write at once for any information they may desire and to begin feeding something for exhibition. Address all communications to International Live Stock Exposition, Union Stock Yards, Chicago, Ill.

EARLY LAMB RAISING

The results of several years' experience in early lamb raising is thus summarized by the Cornell exper sta in a recent bulletin: It is of the utmost importance that the lambs be fat. The market early in the season does not require so large lambs as the late market. The best early market commences as soon as the holiday poultry is out of the way, usually about the middle of Jan. Other things being equal, ewes that give the most milk, breed earliest in the season. The Dorset sheep have bred earlier and fatted better lambs than the Shropshires. There is practically no difference between beets and ensilage as a succulent food for ewes rearing early lambs. Dressed lambs should reach the N.Y. market as early in the week as possible; as Saturday is retailers' day, the lambs ought to be sold before Friday noon.

As a coarse fodder for the ewes and also for the lambs, there is nothing better than good clover hay. (1) In fact, this is one of the essentials to success in early lamb raising. As a rule, ewes respond more liberally to forced feed for milk production the second year than they do the first. The manner in which the lambs are dressed determines ly dressed lambs are always preferred to those of light quality poorly dressed. Ewes should not be forced for milk production until the lambs are a few days old. Be sure that the animal heat is all out of the carcass before wrapping up for shipment; particularly is this of the utmost importance in warm weather. An opening should be made to remove the blood from the chest before shipment.

(1) Pease, pease, pease. ED.

THE STOCK-RAM.

Much of the success with a flock of ewes depends upon the ram. Many a flockmaster has been disappointed with his ram simply because he was too thin and not in condition to start a season's service, the

result being a lot of barren ewes. One of the best ways of putting a ram in condition for service is to give him little grain for a few weeks before he is mated with the ewes. One of the best mixtures to give him is made of equal parts of oats and bran and oil meal. A little sprouted wheat may be added if desired. Of such a mixture a ram lamb should get about three pints a day; older rams a little larger amount. While running with the ewes the ram will get plenty of exercise, and he should be prepared for this beforehand by being allowed plenty of exercise. If he is penned up during a part of the day it is a good plan to feed considerable green feed rather than all hay. (Rape.)

A ewe stays in heat thirty-six hours and returns in heat in seventeen days; so if this period is passed she may be considered safely in lamb. A good ram lamb running with the ewes should be able to cover from twenty to twenty-five ewes, yearlings will cover more and the quota for a two-year-old is fifty, and more. Where a highpriced ram is used, and it is desired to have as many of the ewes in lamb to him as possible; double the number can be put with the ram if he is kept penned up twelve hours out of every twenty-four. His vigor and condition are kept up thereby until the season is over, as he is not allowed to run continually, but has a rest and a chance to recuperate. This is important, as strong healthy lambs are the result. This saving of the ram may be accomplished in another way, i. e., by removing the ewes that have been served from the flock each morning and night. They can be returned in a day or so or when heat is passed. This is the better plan, as sometimes the ram will persistently follow one ewe to the neglect of all other.—"N.W. Farmer."

The Horse.

REARING AND FEEDING THE COLT

By J. H. Grisdale, Agriculturist at the Central Experimental Farm, Ottawa.

To the skilful breeder the destiny of a given colt is practically under his own control. Too many of our farmers consider that their part is done when they have put the mare to a sire whose type they admire or whose breeding suits them. The colt comes in due time and is relegated with the dam to some remote pasture, or even worse, it is forced to follow the mare aimlessly from one end of the soft-plowed field to the other in a weary trudge. Then, as the mare is permitted to rest once in a while to cool down, the colt seizes the opportunity to drink and draws from the foaming udder the over-heated milk, turned from a life sustaining to a death-dealing fluid.

The future usefulness of the colt depends upon nothing so much as the food during the first year of its life. To be useful in any way a horse must have good bones, and above all, good joints. Bones are built, like the rest of the body, from the food consumed by the young animal, and if the food does not contain the elements essential to the growth of bone it is evident that there will be a weakness in this part of the organism. The milk from the dam contains a large proportion of the most necessary mineral substances, such as lime, but the colt seems to require much more in a short time, and may be seen trying to supplement this limited supply by taking occasional mouthfuls of soil.

Probably no materials at the farmer's disposal contain more mineral or bone-forming material than bran and oats, and the colt should have plenty of these and good clover hay from the start. It is quite safe, as a rule, to give as much as two quarts of these concentrates mixed per diem as soon as the colt can be taught to eat them, and this can be gradually increased. The colt's temperament and character should be closely studied, however,

and ration gauged accordingly, These concentrates and clover hay, being rich in protein or flesh-forming material, induce rapid development of muscle, sinew and tendon, as well as bone, and such are the great desiderata in colts. Feed liberally of the right kind of food ; nature will do the rest so far as bodily development is concerned.

Yet nature must be given every opportunity and all her force allowed to do their part of the work. Let the colt have lots of good, pure air. Give it all the sunshine it requires. Stint it not where good, pure water is concerned. Be careful to permit it to lie down frequently and comfortably. Do not over-exercise ; nor yet err on the other side and give too little. The well-fed colt requires more exercise than the average or poorly fed one. As the weaning time approaches, the colt should be oncouraged still more to eat hay, oats and bran. By careful feeding he will scarcely know that he has lost a part of his ration, and will unwittingly substitute that which is provided to replace it. Some people forget to provide a sufficiency of a suitable substitute. Better not to forget. The same ration may be used during all its colthood days, but remember that even larger animals require larger rations.

The training of the colt should begin the day it is born. The first point is to make friends with the shy youngster. The first day it is not, as a rule, hard to persuade the little fellow to stand and he petted, but the longer this is delayed the more difficult it is to persuade his coltship that your intentions are anything but malevolent. Give him a little sugar when you get near him, or some other equally palatable dainty. He will remember this and come to meet you next time. Never make any hasty movement likely to scare him. As soon as on good terms he should be halter-broken. The sooner he is disciplined the more easily will he be eventually got under perfect control.

The colt when once halter-broken, should be gradually accustomed to the bit, and in succession to all other parts of the harness. It is folly to put all the harness on a colt for the first time and hitch him to some old rattletrap of an affair. He is certain, if worth anything, to show his fear and dislike for the proceeding in no pleasant way, and no amount of chastisement or "cuss" words will ever make him what he might have been made.

Handle the colt with care and early accustom him to bicycles, engines, umbrellas and the thousand and one minor unexpected or unusual things that seem to startle most young horses.

To do all this takes time and patience, but the value of the animal is greatly enhanced, and if for the farmer's own use, the pleasure derivable from a properly trained horse much more than compensates for the extra labor involved. Just try it and see.—"N. W. Farmer."

Swine.

BALANCED RATIONS FOR HOGS.

Kansas Farmers can make Pork at a Cost of One Cent Per Pound.

A year ago at public sale I bought thirty-three head of hogs averaging eighty-five pounds each for $3.42 per 100, or $95.93. These hogs were fed just sixty-five days and consumed during the time 250 bushels of corn, worth 28 cents per bushel, or $70, and fifty gallons of skim milk per day, costing one-half cent per gallon at the creamery, or $16.25. The total cost of feed consumed was $86.25, and the hogs weighed 200 pounds each, sold for $3.10 per 100 and the lot sold for $204.60.

The figures show that these hogs gained 1.8 pounds per day for the feeding season, and while the gain is not an extraordinary one, I know many farmers who are pleased with a gain of 4 or 5 pounds per week and think they are making money. The profit in this transaction may be figured as follows :

Selling price		$204.60
Purchasing price	$95.93	
Cost of feed	86.25	
Total cost of hogs		182.18
Actual profit		$22.42

These figures show that with skim milk, comparatively high-priced corn can be fed to three cent hogs, with a profit.

I was not satisfied with the small profits, so determined to feed something approaching a balanced ration, for I was convinced that hogs putting on the second 100 pounds should gain at least two pounds per days per head.

Last fall, when hogs were high in the Kansas City market, I had twenty-four head that averaged 200 pounds each. The hogs were doing so well that I concluded not to sell them, but make them weigh 300 pounds. I had heard many times that it dinn't pay to put on the third hundred and was anxious to try it for myself. The hogs were fed forty-five days longer and consumed during the time 120 bushels of corn worth 25c per bushel, 1,000 pound shorts, worth 70 cents per 100; also a little salt, wood-ashes and four gallons of skim milk per day, worth 9 cents, and plenty of water. At the end of the forty-five days the hogs weighed 308.33 pounds each and sold for $3.70 per 100. The result:

Selling price of hogs		$273.80
Value at beginning of 45 days	$199.20	
Cost of feed	$37.90	
Total cost of hogs and feed		$149.10
Actual profit		36.70

It will be noticed that in the forty-five days the market fell 45 cents per hundred—a speculative feature of the business which greatly reduced the profits of the operation.

By compounding this result with that of the first, these heavy hogs gained the third hundred pounds quicker than the light hogs gained the second, which is contrary to the rule. The first lot gained 1.8 pounds per day at a cost of 2.3 cents per pound and the difference in the price of corn was only 3 cents. But why this great difference? How did we get such a remarkable gain? Was it chance? Far from that. An examination of the rations will disclose the cause. It was corn and cold water. It was corn to make the fat, shorts and skim milk to provide the protein which is absolutely necessary to produce the lean meat and muscle, and salt and ashes to produce the bone. The ration was as nearly a perfectly balanced ration as we can feed under farmer's conditions.

The writer believes that a great many things are to be learned from these two feeding trials, and the first of all is, that the farmer needs education. He must study the cost of production. The day is long since past, when the farmer could keep his stock in a field near a water hole, throw the animals feed occasionally, and make a profit. He must call to his aid, the different branches of science that pertain to agriculture, he should be "good in ciphering" in order to know exactly what he is doing. Let the farmer acquaint himself with balanced rations and feeling standards.

These test show a gain of nearly a pound of pork a day in favor of a balanced ration, as against the old method of feeding corn, corn, corn, and such slop as could be had from the kitchen.

The writer believes that skim milk, and other dairy by-products are very valuable things the farmer cannot well do without.

The gain on the first lot of hogs fed was nearly two pounds per day on skim milk and corn—not soaked or cooked corn, or the droppings from corn-fed steers, but dry ear corn. I firmly believe that if I could have fed forty gallons of skim milk per day to the second lot, instead of four, I would have produced pork at a cost of one cent per pound.

The dairymen of Kansas must study the feeding problem. They must learn to utilize the by-products from their cows and feed all their skim milk at home, instead of hauling it to the creamery, and allowing the "other fellow" to take it home and feed it to five cent hogs. Let us feed all our skim milk, and there will be fewer unsettled accounts, and more happy homes.—M. L. DICKSON, in "Dairy Age."