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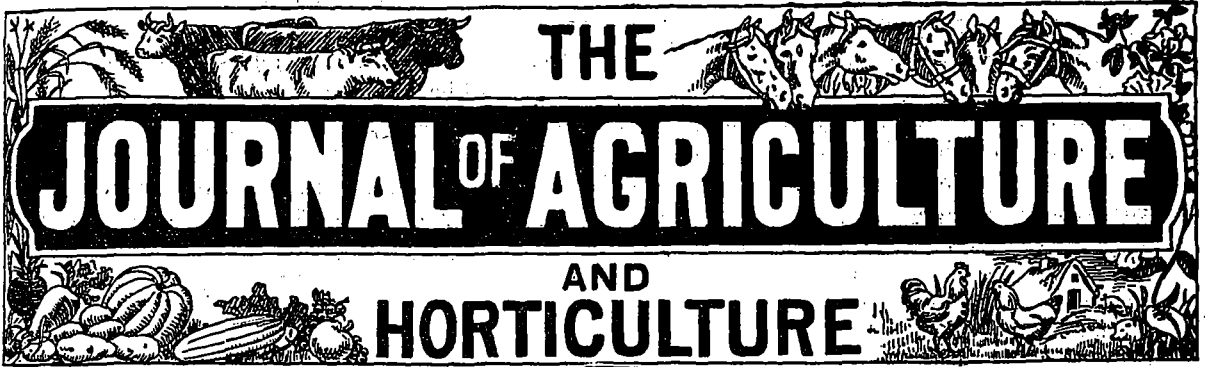
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THE JOURNAL OF AGRICULTURE AND HORTICULTURE

VOL. 2. No. 5

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SEPTEMBER 1, 1898

.. THE ..

Journal of Agriculture and Horticulture

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IN MEMORIAM

A most active, energetic and untirable mind is with us no longer. Worn out by his indefatigable exertions on behalf of the agricultural interests of his beloved province, on the 19th day of August, 1898, Edward Barnard left us, untimely, to lament the loss of one who never hesitated to spend and be spent in the service of his country.

Still, comparatively, a young man, he might have fairly looked forward to a score of years of useful life, but it was not to be, and we must, while lamenting his, so to speak, premature passing away, do our best to follow in his footsteps, and press forward in the path he did his best to trace out for us, the path, that is, that leads to the attainment of the greatest possible amelioration of the practice of agriculture in this land of Canada.

Notes by the Way.

Potatoes.—It is not a common experience to see potatoes harvested—dead ripe, too—on the 12th of August; but such has been our experience this season. They were planted on the 13th April, on a nice sunny, stony bank, with plenty of dung, and were not earthed up *à pic*, but broadly and flatly, so that they had every chance to do well.

As soon as the tubers were ploughed out; with the double mould-board plough, with a *grid-iron* attachment; the land was worked over twice—cross-ways—with an old-fashioned drag-harrow, and all the root-weeds are now lying on the top of the ground, drying up and perishing under the influence of the sun. The crop was a good one, somewhere about 200 bushels, we should say to

the arpent, equal to about 235 to the imperial acre: a good yield anywhere.

Mangels and carrots.—A very interesting feature is presented in a field close to the place where we are writing. The crop is composed of mangels and carrots, rows, both of which roots are close together. We do not hesitate to say that each of the contiguous rows of these plants is heavier by at least 25% than any other in the piece.

Many years ago, a very intelligent man, a Mr. Gray, from Northumberland, Eng., became land-steward to the Duke of Beaufort, in Glo'stershire. The idea struck him that as carrots and mangels do not obtain their food from the same part of the soil, the one being, comparatively, a surface-feeder and the other plunging down into the sub-soil for its nourishment; the leaves of the one being wide-spreading and lofty, while the leaves of the other are, trilling and cling closely to the ground; the idea struck him, we say, that if the seed of each were sown in alternating rows, the yield might possibly be greatly increased. The experiment was carried out, on a small scale, of course, and the upshot was that there was a greater weight of combined carrots and mangels on the experiment-plot, at the rate of several tons to the acre, than on two adjoining plots of mangels and carrots sown separately as usual, the same number of rows being taken in both cases. To the best of our recollection, the difference was 7½ tons to the acre, but as we quote from memory; a pretty accurate one by the way; we cannot bind ourselves to that. The account was printed in one of the earlier number of the Royal Agricultural Society of England's Journals, somewhere about 1848. We were very glad, indeed, to see Mr. Gray's experiment so clearly proved to be founded on correct reasoning, and of universal and not of local application.

Crops in England.—The following are abstracts of 680 reports from the different counties of England and Scotland of the crops of the year 1898. It will be seen that the wheat yield is very much over an average, 64 7-10 of the returns representing it as over an average, and only 5 7-10 as under an average. The hay-crop in the Island is, as it is here, very large indeed, and got in in almost perfect order. Turnips, including swedes, are rather below the average, but to make up for the deficit in those crops, a great many acres of quick-growing turnips and rape will

be sown on the cleared stubbles. On the whole, there will be an abundance of food for the stock during next winter.

GRAIN CROPS, 1898.

	Wheat.	Barley.	Oats.	Beans.	Peas.
Over average ..	3.3	245	226	128	68
Average ..	180	273	216	139	151
Under average..	35	53	230	74	85
Totals.....	608	575	672	341	304

PERCENTAGES, 1898.

Over average ..	64.7	42.5	33.6	37.5	22.3
Average ..	29.6	47.4	32.2	40.8	49.7
Under average..	5.7	10.1	34.2	21.7	28.0
Totals.....	100	100	100	100	100

HAY, POTATOES, AND ROOTS, 1898.

	Hay.	Potatoes.	Turnips.	Mangels.
Over average..	586	208	96	168
Average.....	74	255	299	256
Under average.	23	137	300	138
Totals.....	683	600	695	502

PERCENTAGES, 1898.

Over average...	85.8	34.7	15.1	29.9
Average	10.8	42.5	37.6	45.5
Under average.	3.4	22.8	47.3	24.6
Totals.....	100	100	100	100

In the next set of tables it will be seen that the reports go to prove that this year's wheat-crop is superior to any grown in the last decade, the only one approaching it being the crop of 1896. It appears, that the average yield this year will not be less than 33 bushels of wheat to the imperial acre—28 bushels to the arpent.

PERCENTAGES.

Years.	WHEAT.			BARLEY.		
	Over.	Average.	Under.	Over.	Average.	Under
1887	52.3	41.3	6.4	4.8	41.0	54.2
1888	7.0	21.5	71.5	34.8	44.1	21.1
1889	48.6	42.7	8.7	25.5	50.0	24.4
1890	17.3	52.6	30.1	37.4	53.4	9.5
1891	23.2	57.4	19.4	31.5	52.7	15.8
1892	10.8	38.1	51.1	50.1	42.3	7.5
1893	8.5	26.0	65.5	11.1	24.0	64.9
1894	41.2	45.5	13.3	61.5	32.3	6.2
1895	2.3	22.3	75.4	9.6	34.8	55.6
1896	61.3	33.5	5.2	23.2	29.6	47.2
1897	18.1	43.6	38.3	21.6	55.6	22.8
1898	64.7	29.6	5.7	42.5	47.4	10.1

Years.	OATS.			BEANS.		
	Over.	Average.	Under.	Over.	Average.	Under
1887	2.2	17.0	80.8	0.0	13.0	87.0
1888	30.0	40.0	30.0	25.4	31.1	43.5
1889	27.5	46.0	26.5	21.6	33.6	44.8
1890	44.0	49.0	7.0	56.3	36.1	7.6
1891	14.0	36.3	49.7	11.2	46.6	42.3
1892	15.0	33.3	51.7	5.4	36.1	58.5
1893	9.7	19.7	70.6	3.6	9.6	86.8
1894	57.2	30.6	12.2	39.4	35.7	24.9
1895	4.1	20.1	75.8	3.6	20.5	75.9
1896	11.4	15.6	73.0	11.2	33.2	54.6
1897	26.9	37.7	35.4	31.6	47.3	21.1
1898	33.6	32.2	34.2	37.5	40.8	21.7

Years.	PEAS.			HAY.		
	Over.	Average.	Under.	Over.	Average.	Under.
1887	2.5	60.0	37.5	—	—	—
1888	19.8	29.9	50.3	53.6	26.1	20.3
1889	22.2	46.2	31.6	89.0	10.5	0.5
1890	36.5	49.0	14.5	27.3	30.8	41.9
1891	21.7	56.0	22.3	4.8	33.3	61.9
1892	12.7	45.5	41.8	7.5	9.7	82.8
1893	11.0	30.3	58.7	1.5	4.1	94.1
1894	33.9	43.3	22.8	76.9	18.6	4.5
1895	5.9	31.8	82.3	0.5	8.0	91.5
1896	12.4	34.9	52.7	10.2	10.0	79.8
1897	33.8	53.4	12.8	62.4	23.0	14.6
1898	22.3	49.7	28.0	85.8	10.8	3.4

Years.	POTATOES.			TURNIPS.		
	Over.	Average.	Under.	Over.	Average.	Under.
1888	54.0	22.8	23.2	37.6	36.3	26.1
1889	56.7	35.0	8.3	48.3	43.3	8.4
1890	36.7	37.8	25.5	51.3	33.7	15.0
1891	31.4	63.2	5.4	9.9	45.4	44.7
1892	44.8	48.8	6.4	24.1	46.0	29.9
1893	48.5	31.3	20.2	28.3	30.9	40.8
1894	30.0	44.6	25.4	47.6	34.4	18.0
1895	24.1	48.9	27.0	4.0	22.4	73.6
1896	41.9	39.7	18.4	10.0	23.6	66.4
1897	23.2	46.3	30.5	30.7	52.0	17.3
1898	34.7	42.5	22.8	15.1	37.6	47.3

MANGELS

Years.	Over	Average	Under
1888	37.6	36.3	26.1
1889	44.1	39.2	16.7
1890	37.6	42.2	20.2
1891	15.3	54.5	30.2
1892	24.4	50.3	25.3
1893	16.2	23.5	60.3
1894	43.7	38.9	17.4
1895	5.9	25.3	68.8
1896	6.7	20.9	72.4
1897	37.2	44.5	18.3
1898	29.9	45.5	24.6

Inoculation.—We have to thank Mr. Shutt, of the Ottawa Experiment-Farm, for a copy of his report for the year 1897. In it we find the first of a proposed series of experiments on that peculiar substance *nitragin*, evidently conducted with great care, but, as yet, by no means decisive in the results.

Without going deeply into this matter, which would take a volume, suffice it to say that all food-bearing plants, such as clover, pease, beans, etc., have the power of appropriating the free nitrogen of the air, assimilating it and building it up in their tissues. As far as we know, it is only these plants that enjoy this power; hence, they are known as nitrogen collectors, in contradistinction to all other crops, which are known as nitrogen consumers. Of course, we all knew that wheat succeeded best after clover or beans, though, curiously enough, not after pease, but it was always supposed that it was solely on account of the deep searching roots of those plants bringing up nitrogen from the subsoil, until the two Germans,

Hellriegel and Wilfarth, in 1886, announced to the world that it was chiefly from the air and only partially from their root-work that the *legumes* obtained their supplies of nitrogen.

But we must not supposed that the legumes have this power in themselves; by no means, they can only obtain the atmospheric nitrogen through the intervention of certain *microbes* or *bacteria* that attach themselves to the roots of the legumes upon which nodules or tiny lumps then form. In some way, not at present understood, these microbes, residing in the nodules, absorb the nitrogen of the air occupying the interstices between the particles of the soil, converting it into certain nitrogenous compounds that, after being taken up into the sap of the plant, are converted into its tissues.

Now, the nodules and their guests are not present in all soils, in which case, the clover or beans, etc., can, like all other plants, only get their nitrogen from the nitrates in the land; so the next move was to impregnate the nodule-free soil with other soil taken from a field growing a luxuriant crop of clover the roots of which were rich in nodules. This seems to have answered well; but it was a cumbersome job, and required a great outlay for labour.

The next step, taken by Dr. Nobbe, was in the isolation of the nitrogen-converting microbes from such soil, and the preparation, by certain well known bacteriological methods, of "pure cultures." These cultures consist of colonies of the organisms and the preparation has been named *Nitragin*.

It would appear that the members of the leguminosæ have each their own peculiar bacterium or micro-organism, for it seems that those influencing the assimilation of nitrogen in the clover plant are of no value for the pea crop, and *vice versa*. Hence, the necessity for the preparation of clover "*nitragin*," pea "*nitragin*," etc. These cultures or bacterial preparations, to the number of 17, are now manufactured on a commercial scale in Germany, and a quantity of each, said to be sufficient to inoculate an acre, can be procured for about \$1.25.

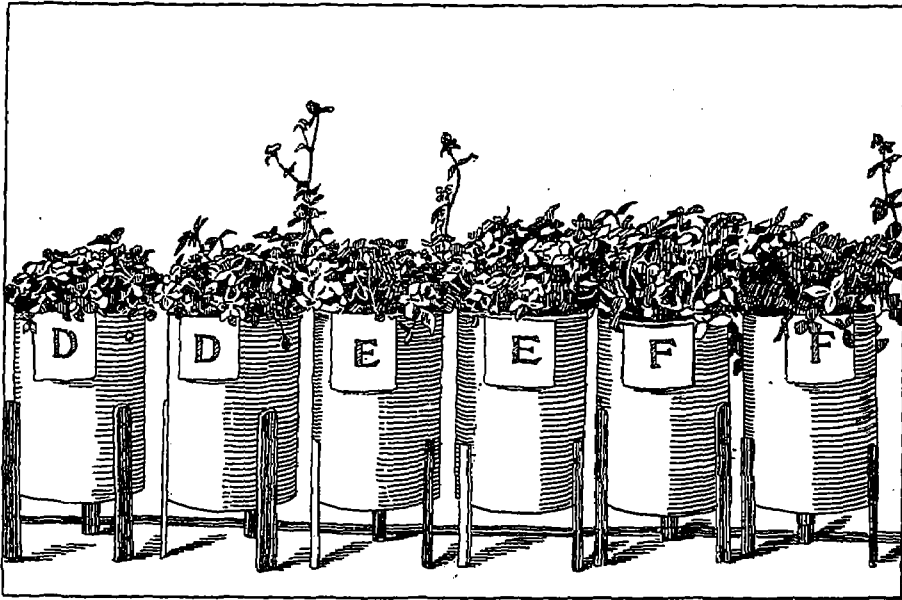
The practical application of *Nitragin* has been made in two ways; first, by diluting the preparation with sufficient water and sprinkling the seed with the fluid, and, secondly, by treating a quantity of soil with a dilute solution of the preparation, allowing the soil to dry, and then spreading

it evenly over the field to be inoculated, which is then deeply harrowed.

Following these methods, experiments have been made in Germany, England, and on this continent. The results so far obtained, as gathered from the reports of these investigations, scarcely admit of any more emphatic statement than that the indication are that on soils that have not previously grown legumes, or for other reasons do not contain the nitrogen-assimilating bacteria, the practice of inoculation will be attended with profit. Some soils contain such an abundance of these microbes that a further supply is unnecessary. European field experiments seem to show that, even when the growth of the foliage is not increased by *Nitragin*, there is frequently a greater

culture, or *Nitragin*, for, it seems, the legumes are exclusively dainty, and refuse to thrive on any other than their own private culture. The experiments were conducted, in duplicate, check-pots, uninoculated, being sown at the same time. Somehow or other, the lucerne and the vetches did not take kindly to the treatment, for their growth was feeble, and it was not considered worth while to weigh and analyse their crop.

The horse-beans did not show any marked difference in foliage, though the plants in the pots containing inoculated soil were decidedly larger and healthier than the others. In the untreated pots, however, the roots of the beans were meagre and had only very few nodules, showing clearly that the *nitragin* had had some effect. When the seed



Inoculation experiments with *Nitragin* for Mammoth Red Clover, Sept. 17th, 1897. Pots D. D., not inoculated; Pots E. E., soil-inoculated; Pots F. F., seed-inoculated.

root development and a larger number of nodules. No great difference could be noted, in these reports, between the results of soil inoculation and seed inoculation, though such differences as there are appear to be in favour of the former.

Mr. Shutt's experiments were carried on in galvanised iron-pots, filled with an artificial soil composed of clay, sand, and swamp-muck, to resemble an ordinary loam of medium fertility. Lucerne, clover, horse-beans, and vetches were the legumes chosen for these experiments, and each plant-pot was treated with its own special bacterial

had been inoculated, the root systems were not so well developed.

The following are the deductions Mr. Shutt makes from the results of the experiments, taken as a whole. We should like to see the use of this novel plan of treatment at work on an extended, practical scale; for instance, on the land of some English or Scotch farmer, and made part of his regular system of cultivation.

"Deductions.—(A.) The largest yield of crop was obtained from the soil-inoculated pots H. H., chiefly due to the greater weight of roots.

(B.) The amounts of nitrogen, ash or mineral matter and organic matter in the plants from pots H.H., soil-inoculated, were, in most instances, considerably greater than those from the seed-inoculated pots I.I.

(C.) The plants from pots I.I., "seed-inoculated," furnished nitrogen, ash constituent and organic matter in amounts intermediate between those from G.G., not inoculated, and H.H., seed-inoculated.

We may, therefore, conclude that in this experiment there has been a decided advantage accruing from the use of *Nitragin*, especially when employed for "soil-inoculation," and that "seed-inoculation," while not giving such marked results, has nevertheless been beneficial in increasing the growth. I further think we may fairly conclude that the additional nitrogen in the plants of the pots H.H. and I.I. has been obtained through the agency of the *Nitragin*."

Sir John Lawes' farm.—The great laboratory farm at Rothamsted is still carrying on its useful work, and the scale of its labours does not seem to grow less. A large number of trained aides are constantly employed for measuring the experiment plots, mixing manures, keeping the meteorological records, counting samples, and so on. There is a lot of or least 45,000 bottles of samples of soil in every condition from the beginning of the work, every one of which is labelled so as to tell the tale in full of its life, so to speak.

The "mixed mineral manure", mentioned in the tables below, consists of phosphoric acid, in the form of superphosphate, muriate of potash, and soda in some shape or other; in fact, of the representatives of the ashes of the plant. This was tried to show the error into which the great German Chemist, Liebig, had fallen in stating that "to produce a good crop of any plant, it is only necessary to supply it with a dressing of the ashes it contains," or words to that effect.

The rainfall is carefully studied. Results prove that the "fertilising rain" is an incorrect phrase, for the rain washes out the nitrogen which is the fertilising element from the soil! Nitrogen is the principal element, it appears, in the fertility of land. Arable land treated only with mineral manures without nitrogen becomes impoverished. Conversion to permanent grass is needed to restore the nitrogen, which is, however, also restored by its fixation from the atmosphere by growing leguminous crops. Even when nitrogen is present in

manures, the plant cannot assimilate it except the soil be "infected" with the power to do so; and this power is supposed to be the work of bacteria. These bacteria flourish in the roots of leguminous plants, and, once present, enable the plants to take up nitrogen freely from the air. Hales, two hundred years ago, found that a plant growing in a pot of soil increased in weight out of all proportion to the very slight diminution in weight of the soil. The Rothamsted chemists have shown that 95 per cent, of the weight of the plant comes from the air, not the soil.

Experiments with and without manures on wheat have yielded the following results :

AVERAGES.	14 Tons Farmyard Manure every year	Without Manure every year	Mixed Mineral Manure alone	Ammonium Salts alone
	Bushels	Bushels	Bushels	Bushels
8 years, 1852-59	34½	16½	19	3.½
8 " 1860-67	35½	13½	15½	31½
8 " 1868-75	35½	12½	14	28½
8 " 1876-83	28½	10½	12½	27½
8 " 1884-91	39½	1.½	13½	32½
20 " 1852-71	35½	14½	17	31½
20 " 1872-91	33½	11½	12½	30½
40 " 1852-91	34½	13	15	30½
50 " 1844-93	33½	13½

The average without manure for fifty years is above the average of the United States, and about the average for the whole world.

Feeding experiments on more than five hundred animals, with subsequent analyses of some of their carcasses, lead to important discoveries:—

It has been shown that for maintenance, for *increase*, and to the exercise of force, the exigencies of the system are characterised more by the demand for the digestible non-nitrogenous, or more especially respiratory and fat-forming constituents, than by that for the nitrogenous or more especially flesh-forming ones.

CROPS IN IRELAND—1898

ANTRIM.

Oats, average. Hay, good average, and well saved. Early potatoes, over average; late ones, bad. Turnips and mangel, average. Harvest, about first week in September.—E. J. Charley.

ARMAGH.

Wheat and oats, good. Hay, over average. Potatoes, average. Turnips and mangel good.—Thos. Wynne.

Oats, average. Hay, average, and well saved ; meadows, over average. Potatoes, average ; no blight, and nearly all sprayed. Turnips and mang-el, average. Harvest, September 1st.—T. A. McClure, J. P.

CARLOW.

Wheat, barley, oats, hay, and potatoes, over average. Turnips and mang-el, average. This will be a productive season all round. Hay crop is heavy, and well saved. Rain now required for turnip crop. Some damage done by grub to lea oats. Harvest will be early.—D. W. P. B.

Barley, oats, and mang-el, good average. Hay, over average. Potatoes, under average. Turnips, doubtful. Harvest, August 15th.—B. F. Bagenal, J. P.

CAVAN.

Oats, fully average, if not over. Beans, little or none ; what there is very good. Hay, light, but good quality, and well saved ; an average. Potatoes, good, over average. Turnips, not looking well, but as it is raining to-day (August 2nd) they will come on rapidly, and will probably be good average. Mang-el, good crop. Harvest, end of month.—Maxwell J. Boyle.

CORK.

Wheat, good, but little grown. Oats, straw long, heads heavy ; if weather is favourable will be an average. Hay, average in quantity ; first-rate in quality. Potatoes, very good. Turnips, bad, under average. Mang-el, bad, but field carrots are a good crop. Harvest, August 12th.—Redmond Reali.

Oats, hay, potatoes, and mang-el, over average. Turnips, average. Harvest, about the middle of August.—E. A. Shuldham, (Lieut.-Col.).

Wheat, average. Oats, hay, potatoes, and mang-el, over average. Turnips, under average. Harvest, from 15th to 20th August.—James Byrne.

Wheat, very good, over average ; not extensively grown. Oats, most luxuriant crop ; if fine weather continues will be far over the average ; white and Tartary oats much grown. Hay, extremely good, and almost all well saved ; over average. New meadow hay is selling at 25s. per ton : old meadow hay at 20s. Potatoes never looked better ; will be over average. Spraying very much used, and apparently of great service. Early sown swedes, very patchy : later sown, looking better ; may be average. Mang-el look well ; average expected. Harvest, August 22nd.

This report is mostly Tipperary, but also includes part of Limerick and Cork.—John Ludgate.

Barley, full average. Oats, very good where new seed was used ; otherwise an average. Hay, heavy crop, over average, and saved in splendid condition. Potatoes, very good, and of excellent table quality : spraying, general. Turnips, good where sown in time. Mang-el, over average. Harvest, now beginning to cut, July 31st.—R. Barter.

Wheat, very little grown ; an average crop. Oats and mang-el, average. Hay, much above average ; good hay selling at 20s. and 25s. a ton. Potatoes, very good, above the average.

The Orchard and Garden.

(CONDUCTED BY MR. GEO. MOORE).

THE PLANTING OF FRUIT TREES AND BUSHES

BY THE REV. FATHER-TRAPPISTS.

(From the French)

(Continued.)

V.

Gathering Fruit—Packing—The fruit-room

Gathering the fruit.—It is very difficult to indicate any exact time for gathering the fruit ; it varies with the year, the site of the Orchard, and the variety ; it is essentially a business which requires personal observation.

Whatever the nature of the fruit it must be harvested in dry, cloudless weather. Summer apples should be gathered a day or two before their complete maturity, and disposed of as soon as gathered, as they will then stand a journey better than if quite ripe. Autumn and winter apples keep all the better according to the longer time they take to ripen. They should be gathered before they are quite ripe. Plums and cherries should be quite ripe when gathered. The tree should never be shaken to make the fruit fall ; it would be bruised, rendered unsaleable, and would not keep long. Fruit should always be picked by hand ; never climb the tree, as that would bruise the bark and break the branches ; but use a step-ladder sufficiently long to reach the highest part of the tree. The fruit should be placed carefully in baskets, and taken to the packing-room in good condition.

Manner of keeping fruit.—The fruit-room should be so constructed that cold cannot enter; rather dark, free from too much moisture, and yet not too dry. The fruit should be placed on shelves with the stalks downwards, and must not touch each other; they should be placed in their separate varieties, and each sort labeled. During the first four days they should be wiped dry, very lightly, with a soft cloth.

Those who have no fruit-room in their houses can keep fruit very well in the following manner. A perfectly clean barrel must be provided, and the bottom covered with a layer of fine sand mixed with slaked lime; on this place a row of apples, with the stalks upwards, and not touching each other, fill the spaces between with the same sand and lime and completely cover the first layer, lay a second row of apples on this with the stalks downwards; next fill in with the sand and lime, and so on, until the barrel is full, covering all with sand; then close the barrel, making it all tight. As fruit is taken out for use, the last layer should always be kept covered.

If, for want of care, apples are frozen, they may be restored thus; fill a large vessel with moderately cold water, put the apples in, and place it in a warmish room. Shortly afterwards, there will be a coat of ice formed round the fruit; when this is taken off, there will be found to have regained their original flavour.

Packing fruit.—Generally speaking, it is better to pack fruit for market in compartment boxes; such as are used for eggs; each fruit being wrapped in thin paper, and placed in its own compartment. Apples must thus be of uniform size, and will not knock against each other during a journey. Boxes of 16 dozen of Wealthy have realized 70c a box, off the tree.

Fruit is usually taken to the local markets in barrels and packing begun at the head; to close the barrel a very simple press, well known in the country, is used. The name of the variety is marked on the cover. Beside selling the fruit, making cider and drying are also good means of utilising surplus fruit. We engage that, if the farmer adopt the preceding plans, he will, we are sure, find the key to success.

Apple-trees.—The apple-tree rejoices in a dry, rather than in a moist soil, no matter how gravelly. To yield well, and long maintain its vigour, it requires a deep, rich, and mellow soil. It is the fruit-tree of the future for the Province of

Quebec, and by choosing proper varieties, apple trees can be planted as far as the regions of the north. Apples are a delicious fruit, and bring to the family comfort and welfare; there is no proprietor who may not have a few apple trees on his land, and thus have, at all seasons of the year, fruit of first quality, sound and wholesome.

The following varieties, having been proved to be the best for this country, should be planted in preference to others.

Summer apples

Yellow transparent.—Fruit pale yellow, medium size, and of excellent quality; flesh, turning white to pale yellow at complete maturity: the tree is vigorous and an early, and abundant bearer; ripens at the end of August.

Strawberry of Montreal.—Fruit medium size, red all over the surface, except the side away from the sun where it is a bright golden yellow; flavor aromatic and agreeable. Tree vigorous and hardy; ripens at the end of August.

Red Astrachan.—Fruit about medium size, color bright red with dark dots. A magnificent apple of first quality. Tree vigorous, but a little late; succeeds well in the north, ripens at the beginning of September.

Tetotsky.—Fruit a little above medium, red and golden yellow, flesh white, juicy and a little acid, with an agreeable perfume. Tree vigorous and hardy, bearing early and abundantly: ripens in mid-September.

Autumn apples

Duchess of Oldenbourg.—Fruit about medium, red striped and barred with yellow on the side opposite to the sun, flesh juicy, slightly acid, tree vigorous and very hardy, bears early and abundantly. It is the apple for the neighbourhood of Quebec; ripens at the end of September and the beginning of October. This is a grand apple both for the local market and exportation.

Alexander.—Fruit very large, red all over, flesh white, a little acid, flavor agreeable. Tree vigorous and hardy, ripens from October to December.

Chenango's strawberry.—Fruit medium size, red and pale yellow, flesh white, juicy and very tender. Tree vigorous.

Maiden's blush.—Fruit medium, pale yellow, slightly colored on the side opposite to the sun. Succeeds well every where and should be planted.

Red Beitigheimer.—A German variety, rare and highly esteemed, skin pale, but a deep red in the

sun, flesh white, a little acid, flavor agreeable. The tree is vigorous and hardy.

Flameuse.—The most popular apple in the vicinity of Montreal, fruit medium, red and pale green, flesh white, tree vigorous and hardy. The apple spots easily and should be treated with Bordeaux mixture.

Haas.—Fruit medium, red and pale yellow, flesh white, tender and juicy, a little acid. Tree exceedingly vigorous and hardy, ripens from September to November.

Winter apples

Wealthy.—Fruit about medium size, brilliant red, principally on the side exposed to the sun, sometimes a little greenish in the shade, it will keep until February, and is the fruit "par excellence" for exportation. The tree is vigorous, hardy, and produces abundantly.

Canada Baldwin.—Fruit medium large, skin smooth, yellow, striped with carmine and crimson, sprinkled with large dots; flesh white, frequently tinted with deep rose, firm, juicy and sub-acid, having a slightly astringent taste, peculiar but not disagreeable. Season mid-winter and later; tree vigorous and hardy, succeeds well in clay-loams.

Ben Davis.—Fruit large, round, sometimes a little conical, pale yellow, strongly marked with red in the sun, flesh, white, juicy, and sub-acid, quality medium. Its specialty of keeping until the spring and its beautiful appearance, make it a favourite in the English market where it fetches a high price. The tree is vigorous and very hardy.

Golden Russet.—Fruit medium, of a beautiful color, golden yellow with the skin sometimes reddish brown, juicy, and of an exquisite flavor; will keep until the spring. Tree vigorous, hardy, and prolific, ripens from November to April.

Longfield.—A Russian variety very much to be recommended, fruit small, yellow and red, of an agreeable flavor, and keeps well until March. The tree is vigorous and hardy.

Mann.—Fruit about medium size, green, sprinkled with black dots when gathered, but changing to deep yellow when perfectly ripe; its exquisite flavour and perfume make it a great favorite. The tree is vigorous and hardy; keeps until April.

Macintosh Red.—About medium size, round, slightly flattened, deep red all over; flesh white, juicy, flavor and perfume exquisite. Tree vigor-

ous, hardly and an abundant bearer. Keeps from November to February.

Northern Spy.—Fruit large, slightly conical in form, pale yellow streaked with crimson on the side exposed to the sun, ripens in January; it succeeds best in the neighbourhood of Montreal and towards the south.

Pemankee.—In size medium, ribbed and slightly conical in shape; skin, a clear yellow, perfume exquisite, these qualities make it a first-class fruit for exportation. The tree is vigorous and succeeds everywhere. It begins to bear late, but gives excellent crops.

Pomme Grise.—Fruit small, grayish red, flesh tender and aromatic. The tree is vigorous, but it only succeeds well in the South and West.

Quebec Winter.—Fruit medium size, color yellow, with dashes of red next the sun; flavor agreeable; this variety is highly recommended. Tree vigorous and hardy.

Roxbury Russet.—In size about medium; dark-green sprinkled with dashes of a yellowish brown, flesh greenish white, not very juicy, flavor agreeable. Tree vigorous.

Salome.—Fruit average size, round and conical; yellow, with reddish tint next the sun; flesh, pale yellow, juicy and with a pleasant flavour. The fruit will keep easily until June. Tree vigorous and hardy.

Scott's Winter.—Fruit medium in size; color varies from bright red to reddish brown; flesh, pale yellow, slightly tinted with red near the skin, its flavour and perfume render it an apple of the first quality; the tree is very vigorous and very hardy, bears abundantly and the fruit keeps till June.

Smith's cider.—Fruit larger than medium, yellow fleshed with red; flesh tender, juicy and rich, ripens September to March. Tree vigorous.

Babbitt.—Fruit very large, almost entirely red; flesh juicy and rich, October to spring. Tree hardy and vigorous.

Wolf River.—Fruit very large, pale green with sometimes a little crimson; flesh, white, tender, and juicy; January and February. Tree hardy and vigorous.

John Richardson.—Fruit very large, red all over but sometimes greenish in the shade. Tree hardy and vigorous.

Reinette du Canada.—Fruit very large, a dull

yellow; flesh white, firm, rich and of the first quality, November to March. Tree vigorous and hardy.

Crabs

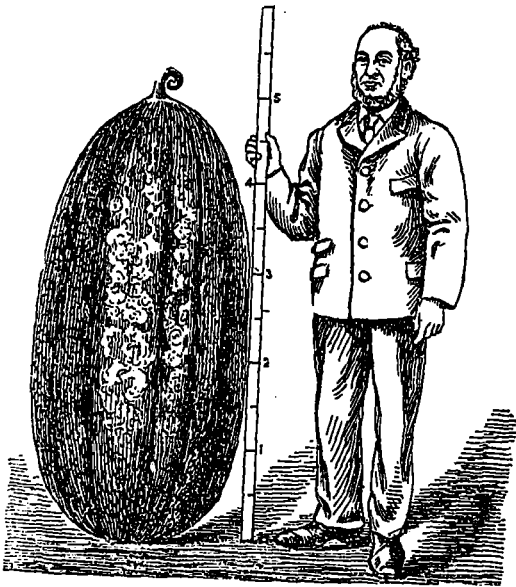
Hyslop's.—A crab highly esteemed for its size, brilliant red color and keeping qualities; the tree is hardy, vigorous and a very abundant bearer.

Transcendent.—Fruit medium, red and yellow. The tree is hardy, vigorous and yields abundant crops.

Whitney's Seedling No. 2.—Very large, an excellent dessert fruit; still better when cooked, and makes capital cider. The tree is beautiful in shape, and produces abundantly.

Early strawberry crab.—A variety highly recommended, hardy and vigorous.

Tall Water Melon.



A Tall Water melon.

Rocky Ford, Colorado, is famous for melons, and the above is supposed to represent Senator G. W. Sevink with the largest ever grown; it was nearly five feet long, 34 inches in circumference, at the thickest part, and weighed 98 pounds. It furnished the delicious part of a feast given by the senator to a number of farmers and fruit growers.

PERENNIAL PHLOXES

There are few more beautiful ornaments to the later summer flower garden than the perennial Phloxes; the ease with which they can be cultivated and the length of time they keep in blossom should render them more popular.

They delight in a rich mellow soil and are perfectly hardy, requiring no care except keeping the soil about them free from weeds and aerated by occasional hoeing; generally speaking they require no staking as the stem is sufficiently strong to support the flower; however some of the taller growing varieties may do so and these will well repay the trouble. Any one who saw the magnificent display of Phloxes at the Massachusetts' Horticultural Exhibition on the 13th instant could not fail to have been impressed with their beauty, specially since such very great improvements have been effected in the markings and colourings of the newer variety. The most striking and novel one, exhibited on this occasion, was *Richpin*, white shaded to the centre with deep rose pink; another very bright coloured variety was *Mars la Tour*. Phloxes can be propagated by cuttings or dividing the roots and when once established will increase rapidly by stooling and make splendid objects in the front of shrubberies or ruined groups of Perennials, their color contrasting admirably with those of the gladioli which flower at the same time.

Coleus

After all no class of foliage plants are so useful for the hedging or carpet garden as the Coleus, the foliage is so beautifully marked, the lines of demarkation in many of the varieties so distinct, and the colors so rich and variegated that it is possible to imagine their glories equalling, and even surpassing many flowers—the most effectual for masses of brilliancy are the self coloured varieties and it is doubtful whether there are yet any better than the old *C. Versckafelter*. Coleus are rather difficult to keep through the winter requiring a warm, not too damp atmosphere and are very subject to mealy bug, which however is easily overcome by the use of weak coal oil emulsion laying the plant on its side and spraying carefully the underside of the leaves and their axils, on which the insects are the most numerous. Coleus root easily in the spring and especially so in a propagating house or hot bed, where they can be subjected to bottom heat.

Poppies and Cosmos

Of late years there has been a growing taste for flowers which have a sort of Oriental appearance and the Poppies have come to the front. The odor of the poppy tribe may not be very agreeable and may give us to keen an idea of the presence of opium, but it is our fault if we inhale much of it, and we can admire the gorgeously rich crimson of the perennial—*Papava orientale*—the glowing scarlet of *nudicaule* or the delicately yellow *Cambricum*, and the annual varieties with their gossamer petals so sylph like, that one can imagine that the slightest breeze would blow them away. The perennial poppies are propagated by dividing the roots, but the less they are disturbed the better. The *Cosmos* are also fairy flowers—single of various brilliant crimson, purple or pink, flowers of loose straggling habit of growth with graceful delicate fringe-like foliage, easily raised from seed, and their very fragile appearance makes them very attractive, they continue in blossom until late in the autumn, propagated by seed sown early in the spring.

CURIOSITIES OF PLANT LIFE

Night flowering Campion or *Catch fly* has some curious qualities. It is one of the remarkable plants that opens its blossoms at night or on dull cloudy days, and like many other night flowering plants it exhales a delicate faint odor.

It is called "Catchfly" because just below the blossoms a sticky substance is sent out from the flower stem and this entraps insects which would climb up it to secure honey from the flower and would take it away without disturbing the pollen; and would therefore be useless in assisting the fertilization of other flowers to which they would otherwise carry it. So wise and wonderful are the provisions of nature that a close observe may find a reason for these peculiarities.

Household Matters.

(CONDUCTED BY MRS. JENNER FUST).

Many people complain that they never can or will wear flannel underclothing.

There are those who suffer from a tender and delicate skin, so much so, that the least bit of roughness causes them much real misery.

And there is no doubt about it; some people pay but little attention to this matter in children, but often put down to ill temper what may be caused from nothing but the irritation of the skin.

I have just been reading an article from an English paper on this very subject in which the writer speaks of a certain clothing just brought out that is going to make a revolution in the matter of underwear. If it proves successful, it will be a comfort to the tender-skinned people, and to every one else who studies and dress to suit the climate in which they live.

The whole question of health depends upon sensible dressing and living.

CELLULAR CLOTHING

Now let us look into this new departure and see what it will do for us.

Cellular clothing is said to be made in merino, silk and cotton; it is porous, light in weight and yet retains heat, the three qualities which ordinary materials do not possess together.

In a word, this cellular system, which might be called the common sense one, shows clearly that it is the air-containing capacities of these clothes which tend to keep the body in a healthy state in hot or cold weather.

In our climate, where the temperature varies so much one day from the other, the blessing of anything that will protect us from chills cannot be too highly estimated.

This summer has been a most trying one to many people, and in spite of due care being taken by many, quite a number of them have been laid up for days, owing to catching cold from the chilly air of the night, and the often damp rainy days.

In some cases this has been caused entirely by not dressing to suit the weather.

So we must hail with delight anything that will help us to amend our carelessness on these occasions.

I may mention that there is the complete suit: even stays are made of this material, and complete suits for men.

BREAD ROLLS

Hot rolls are very much appreciated for breakfast during the warm weather, especially by our menkind; but I am afraid that in these degenerate days we do not rise early enough in the morning

to prepare them in time for breakfast, so we eat them at tea time instead. Very appetising bread and butter may be cut from them when cold. Into an earthen bowl put two pounds of the finest flour, and mix in a teaspoonful of salt. Put an ounce of German yeast into a small basin, with a teaspoonful of flour and another of sugar. Mix well with half a pint of lukewarm milk, cover with a saucer, and let it rise. Meanwhile melt one ounce of butter in half a pint of milk, then let it get rather cool. Make a hole in the flour, mix in the milk and the yeast, and knead into a nice light dough. Cover with a cloth, and let it stand in a warm place for two hours to rise. Form the dough into rolls, allowing them to rise again for half an hour. Bake in a quick oven from twenty to thirty minutes. When nearly done brush over with milk and return to the oven to finish baking.

SPANISH BUN

One cup of brown sugar, half a cup of butter, yolks of three eggs, two teaspoonfuls of ground cinnamon, one teaspoonful of ground cloves, one teaspoonful of soda, half cup of hot water poured on soda, essence of any kind; add flour to make a stiff batter, bake in square pan; when done, add the whites of three eggs, and three tablespoonfuls of white sugar, beaten to a stiff froth, spread over top of cake, and return to oven to brown slightly.

FRUIT SYRUPS

These are very useful to have in the house for cooling drinks, sherbets, and various other things. A mixture of cherries, gooseberries, and raspberries makes a syrup of an excellent flavour; or, instead of gooseberries, red currants may be taken. Allow four pounds of gooseberries or currants to two each of cherries and raspberries; the fruit must be quite ripe and sound. Clear it from the stems, put it in a large vessel, and crush each berry with a wooden spoon. Let it remain for six or seven days, and it will slightly ferment. When the juice looks clear, strain it through a hair sieve, pressing the fruit with the hands to extract all the juice. Weigh the juice, and to every pound allow a pound and a quarter of sugar. Boil together about five minutes, removing the scum as it rises; let it cool, then bottle for use, and keep the bottles in a cool cellar. A tablespoonful of this

syrup in a glass of water, with a lump of ice in the middle, makes a delicious drink. If too sweet, a little lemon juice may be added.

STRAWBERRY JAM.

To every pound of fruit allow one and a quarter pounds of loaf sugar, and a good half pint of red-currant juice. Pound the sugar roughly, and pick the strawberries. Lay the latter on a dish, and sprinkle over them half the sugar; leave till next day. Draw the juice from the currants by the common method, put it into a pan with the remainder of the sugar, and boil together until it slightly coats the spoon. Now add the strawberries, and boil again until the whole will cling to the spoon, or until a little will jelly if placed in a cool plate. Stir this jam as little and as carefully as possible, as the fruit should not be broken. About twenty minutes will be long enough to boil it; if cooked too much it will lose its colour. It is not required to be very stiff.

A commoner kind of strawberry jam may be made like above recipe for plain gooseberry jam, allowing three-quarters of a pound of sugar to each pound of fruit. The fruit will not remain whole done in this way.

No matter what method you have to prevent fruit jars from cracking when filling with hot fruit, writes a housewife, oblige me by trying this:—Place a silver knife, fork, or tablespoon in the jar and pour in the boiling fruit. A teaspoon is of convenient size for jelly glasses. Simply have your jars clean—no heating, scalding, wet towel, or anything of the kind is necessary. Set the jars in a row, and as one is filled remove the piece of silver, placing it in the next one to be filled, and so on. I have used this way all the years I have kept house, and my mother has for twenty years or more. If your jelly glasses have glass or metal covers discard them and paste paper over the top instead; there is then no danger whatever of mould.

RED CURRANT JELLY.

Do not strip the currants from their stalks, but if at all dirty they may be washed, then drained as dry as possible. Put them a handful at a time into a piece of cheese cloth, or strainer, then squeeze all the juice through with the hands. Continue until all the fruit is squeezed, then weigh

the juice, a pint of which will weigh about a pound. For every pound of juice allow three quarters of a pound of sugar, make this very hot in the oven, and it should also be broken up small. Boil the juice alone, for about twenty minutes, pour it hot over the sugar, and stir till quite dissolved. Turn it at once into small pots, without boiling again. If it is not set by the following day, stand the pots in the sun for a time, this method is generally effectual.

PRESERVED EGGS.

Now is the time, when eggs are cheap and plentiful, to preserve some for use in the winter time, when new-laid eggs are very dear to buy and the shop eggs becomes a suspicious thing. Procure new-laid eggs when they are cheap, pack them in lime water, and they will keep in good condition for many months. Pour one gallon of boiling water over a pound of lime; when settled and cold pour it carefully over the eggs which you have packed, small ends down, in a stone jar, and stand in a cool, dark place. Eggs may be also packed in salt. Anything that will close the pores of the shell and prevent evaporation will preserve eggs. When needed for boiling the ends of the shell should be perforated with a needle. This will prevent cracking, which often occurs if this precaution is not taken.

BAKED EGGS.

A great variety of flavors can be given to baked or, as they are sometimes called, shirred eggs. Heat and butter the dish, and drop the eggs carefully in, so as not to break the yolks, sprinkle salt and pepper and small bits of butter on each egg; place in a very moderate oven until the white is just set and serve immediately. For variety you can sprinkle chopped ham, tongue, parsley, or grated cheese over them.

Another way is to take one large tablespoonful of butter and put it into a saucepan. When it is melted add a generous teaspoonful of flour, stir until smooth, place at one side of the stove and gradually add one cup of cold milk, half a teaspoonful of salt, and a little pepper. Let this boil up once and then pour into the egg bakers. Take six or eight eggs, ad, being careful not to break the yolks, drop them on top of the sauce. Sprinkle

chopped parsley over the whole and bake until the white is just set. Serve at once.

SCALLOPED SALMON.

One can of salmon, drain off liquid, mince the salmon fine, butter the dish, then place a layer of salmon on, and a layer of bread or biscuit crumbs alternately, seasoning each layer with salt and pepper, keep the bread crumbs on the top, pour the liquid over, then fill to top with milk, bake three-quarters of an hour.

POTTED MEAT.

During the summer time we are apt to want something savory to take the place of the cakes and preserves which generally find a place on our tea and breakfast tables, and I can recommend this potted meat to your notice. It makes an excellent relish, is easily and cheaply made, and will keep good some time if stored in a cool, airy place. A piece of the shin of beef, about three or four pounds, should be placed in an earthenware vessel with just sufficient water to cover it. Stand it in a corner of the oven and let it simmer some six hours. Take out the meat into a wooden bowl, and, carefully removing every bit of skin and gristle, pound it with a pestle until it is reduced almost to a thin paste. A tablespoonful of salt, half a teaspoonful of pepper, a pinch of ground mace, and a teaspoonful of bloater-paste should be added to the meat with a little more of the liquor, and the whole pound in. When fine enough press down into small pots or shapes, and cover the surface with dissolved butter. The remaining liquor in the vessel is almost as good as beef tea, and will serve for the latter quite as well, or if previously cooked vegetables be added to it makes excellent and nourishing soup.

The Poultry-Yard.

POULTRY IN TOWN AND CITY

A considerable amount of the poultry raised in this country is owned in cities, towns and villages, and I may say safely that town people nearly always keep pure breeds and know as much about raising poultry as do the farmers. I think a small flock pays better in the city than in the

country. A friend says: "I have a flock of 22 chickens, 8 hens and 14 pullets, which I raised myself. I keep them in a coop, 5 by 9 feet, which slauds in a yard, 18 by 20 feet. In the month of January, I got 257 eggs and the cost for food during that period was 60 cts. for corn and meal.

"All the scraps from the table are saved, even the water the vegetables are boiled in. Then I boil enough of potato peelings, rutabaga and turnip peelings, cabbage leaves, etc., to last three or four days. With that the kitchen scraps and

22 hens, but he says, he got 257 eggs in January, which is evidence that he manages them on correct lines. The size of the yard is not so important as to keep the hens at work. They can be kept busy on a small plot as well as in a large space, by giving them litter in which to scratch. When feeding them be sure to give too little rather than too much. Allow them to finish each meal somewhat hungry and then scatter a gill of millet seed in the litter which will induce them scratch and work vigorously. It is not wise to feed them every time you leave scraps. A light meal in



LINCOLN SHEARLING RAM.

Bred by and the property of Mr. Hy. Dudding, Riby Grove, Stallingsborough. First and Champion R.A.S.E. Show, Birmingham, 1898

a handful of meal I feed my chickens morning and night, but give it to them warm. But where the city folks have the advantage over the chicken raisers in the country is in the feeding of green bone, which can be bought at the butchers for the asking, I have a green bone cutter and I would not part with it for a good round sum, if I could not get another. Of course, it costs a great deal for a few chickens, but the saving in food will pay for it in a year, leaving out of consideration the gain in eggs."

The house and yard are both rather small for

the morning and a full meal at night is sufficient, especially in the summer, else they will become too fat and in danger of bowel disease. One reason why a small flock pays in the city is that there is but little cost for labor. True there is some labor required, but it is so bestowed as to cost nothing. Fowls in yards should be fed at regular intervals and not too often. If fed often they will not scratch and will appear to be always hungry, following the attendant wherever he appears. This is only a habit which they learn. They are not hungry at all but too lazy to work. Keep

hens, which are confined, at work. If they do not work, starve them down to it. No work, no eggs. Plenty of work means healthy fowls, little expense and a full egg basket.

POULTRY NOTES

Eggs are the outcome of brain force. The laying hen is the nervous animal always. Heads easily indicate characteristics; select the long head, not too full between the eyes, fairly good in width and carrying a mild yet impressive eye.

Poultry Hints

Hatching chicks with incubators is now a success. It is no trouble to hatch chicks by the bushel, but the nice work comes into brood and properly feed and care for them. To make a success of that there is much to be learned.

Experience is a great school in poultry raising and the mistakes are guideposts to keep everyone in line. Get all the experience you can and avoid making the same mistakes twice, and then you will be on the road to a profitable success.

A healthy fowl needs no tonics. The best way to use a tonic, if it must be given, is in the drinking-water. A teaspoonful of red pepper in a peck of food is sufficient, should it be necessary to use a tonic; a better material is a teaspoonful of the muriate tincture of iron in a gallon of water used for drinking.

The chicks of some breeds, such as Games, Leg-horns, Minorcas, Dorkings, etc., feather so rapidly that they often droop from the excessive drain on their vitality. They require in such cases, to be treated nearly the same as young turkeys, as very nourishing food is required.

Denmark's foreign egg trade has grown to enormous size; mainly with England. Twenty years ago, the annual Danish Export of eggs was 600,000, now it is reckoned at 111,000,000.

When a man starts in the poultry business, it may be for pleasure only as he speaks of it, but how long, will he be willing to run it. Just for

the fun of it, if he fails to make both ends meet. He advertises briskly for a while. Just for the fun of it, but soon drops out and all is dark. Constant advertising is an indispensable condition of continuance in this avocation.

Market only eggs that you know to be strictly fresh. High quality of any product increases the consumption. In selecting your breeders look for those which have a bright active look about them, those which work the hardest to get a full crop to go to roost with. Size is also one of the principal features of a profitable flock, for a pound or two counts up considerably when the entire flock is considered and the ultimate end of our feathered friends is either the market, or family table.

The best type of an all-around general purpose fowl is a hen that has fair length of body and deep through from back to keel bone, with broad body, full round breast and legs well set apart and of medium length, not too long. A hen of such a type is almost sure to be a good layer of large sized eggs, and when she is placed upon the scales will weigh nearly one-fourth more than other birds of her size. It is a compact, blocky, hustling hen that the wide awake farmers and market poultry-man are in search of.

To Distinguish Fresh Eggs

There is a very easy way of telling whether an egg is fresh that I have not seen published in the JOURNAL, but still it may be well known. It is this: When a fresh egg is placed in water, it will lie flat at the bottom of the vessel, and as it becomes stale the large end will incline upwards.

Poultry Paragraphs

The utilization of poultry on unprofitable locations opens an avenue for desiring returns from a source that is within the reach of all. There are farms which will not pay in crops, and there are what are called "abandoned" farms which will serve as well for poultry as the best soils known. One reason why poultry has not been used on such locations is that farmers do not recognize the importance of caring for the fowls. They either try to crowd a large number on a small space or they turn them out to support themselves. The first great difficulty to encounter is to educate

farmers to a knowledge of the fact that poultry must be placed on a level with other farm stock and receive the same consideration.

It is more profitable to thin out the surplus stock in the summer than to delay it until fall, because better prices can be obtained for small chicks now than for larger ones that are kept over. Feed will thus be saved and room given to the adults. The summer is the time to get an abundance of eggs, and if the opportunity is lost, it cannot be regained in winter. The tendency to crowd poultry and to attempt to secure more eggs by allowing the flock to increase is strong with farmers, as a class, but it is a mistake to keep large numbers unless there is a corresponding increase of space, and especially in shelter and roosts.

It is often discussed as to whether milk will take the place of meat for poultry. Milk is really superior to meat, but the fowls cannot drink enough of it to enable them to substitute it for meat, which is more concentrated. To derive benefit from one pound of solid matter in milk, the hens could have to drink about eight pounds of milk as there is only about 13 per cent of solids in milk. The consumption of such large quantities of fluid is not natural to fowls. They prefer meat, and are not milk-consumers if they can obtain its substitute, being averse to the use of such large quantities of water.

Early moulting again—Some difficulties to be overcome—What others say about early moulting—What the farmers may do.

It may appear rather late in the season to resume the subject of "Early Moulting," but much can yet be done to hasten the moult and have the yearling and two year old hens laying in November, or, December. In my last letter we tried to show how to bring on an early moult by allowing the hens free run in a field, or, fields where they could find clover, grass and insects life, the male birds having been first removed to a separate building. If the hens cannot have such a run then they must be supplied with green stuff and cut green bones, or, meat (cooked) in some shape. We prefer to have the meat cooked, because experience has shown that the feeding of

raw meat, unless the hens have been accustomed to it, is apt to bring on dysentery and so retard rather than further your object. As has been repeatedly said in the pages of the JOURNAL OF AGRICULTURE there is no better ration for moulting, or, laying hens than cut green bone.

SOME DIFFICULTIES TO BE OVERCOME

It may be said that it is not always convenient to obtain green, or, raw bones. In such a case the farmer is generally away some distance from a town or city, but he is more than likely to be able to give his fowls range and so afford them opportunity to find insect-life and the equally important clovers and grass. The farmer near town or city has opportunities to procure green bones or other forms of meat waste from the butcher shops. You at once say, "Oh! then he requires a mill to cut up the bones." "Certainly he does," we reply "but then he has opportunity to obtain a better price for his product." If there was a steady demand for cut bone, enterprising butchers would soon purchase mills, which do not cost much, and supply the article ready for use. Then again those farmers, who are really anxious to make their poultry pay, could club together; purchase a bone cutter; place it in a convenient locality (may be where there is steam or windmill power) and use it in turn. Where there is a will there is a way. The dairy farmer has had many difficulties to overcome. The silo was not accepted without a certain amount of hesitation and opposition. But it came to stay. Indeed, there are difficulties to be met with in every department of farm work. But the importance of cut bone, or, meat during the moulting period cannot be over estimated. And it was well and truly said, in your last issue, that no better food can be given to laying hens to enrich the flavor of their eggs than green cut bones. It is much to be desired that these matters were better understood than they are.

WHAT OTHERS SAY

Mr. A. W. Kenney of Yarmouth, N. S., wrote to me *in re* the subject of shortening the moulting season, that he had succeeded in doing so to a remarkable extent by feeding boiled bultorks heads, cut up in his bone cutter, the heads first being broken up with an axe, so as to have the pieces fit the cutter. He fed liberally and assured me that not only was the moult shortened but many of his hens, during that period, laid well. Miss

Ryan, of Barriefield in the district of Kingston, Ont., also wrote me on the subject and as her method of treatment is decidedly original; the following quotation from her letter, is given:—"In regard to shortening the moult, I beg to say, that on the 13th August, 1896, I plucked a year old hen and six days later plucked eight more. They were all laying at the time. The fowls did not seem to suffer the least inconvenience, but seemed more lively. Some of the down was left on their bodies. They kept on laying for ten days after being plucked and then ceased until Saturday last, 3d October, when the first one, plucked, on 13th August, laid, and has continued to do so since. A week after being plucked the body of the hen first plucked was entirely covered with pin feathers. All the hens plucked are now (7th Oct.) entirely covered with beautiful, glossy new feathers, wings and all. In marked contrast are the *older* and unplucked hens and cock bird. They are just beginning to look drowsy, in their first stage of moulting. There is not a doubt but that in this case be forcing moulting was successful. I do not intend to let another fowl I own suffer from discomfort or cold by moulting in the old fashioned way. I should add that the fowls experimented on got no extra care. I, however, dusted them well with insect powder to prevent lodgment of lice."

While Miss Ryan's plan might not be convenient in the case of large flocks, it however teaches, in no uncertain manner, the following:—

- 1.—The advantage of early moulting in making early layers.
- 2.—The benefit of young stock as compared with older birds.
- 3.—The shedding of the old feathers was quickly followed by new pin feathers.
- 4.—Hence the necessity of aiding the fowl to get rid of her old feathers.

WHAT MAY BE DONE NOW

What will be of paramount importance to the farmer when he reads this, will be some plan of action that he can at once put in effect. Well, he can do the following:—

- 1.—Weed out all hens over two years of age.
- 2.—Fatten up the old hens, previous to moulting, and make pot pie of them, or, market them as old hens and nothing else. Bad advice, I think I hear you say Mr. Editor! But let me assure you and your numerous readers, that a well

fattened three year old Plymouth Rock hen, is good eating, when properly cooked. We will return the subject.

3.—Utilise waste of table and kitchen, small potatoes, &c., in a mash, to be well cooked and fed in judicious quantity three or four mornings of the week. Let fowls run in fields, or, orchard, Give whole grain for afternoon ration. Give no noon ration. Fed grain other mornings when mash is not fed. If cut bone can be had feed four mornings of week in ben of grain.

4.—Have your poultry house fairly comfortable and scrupulously clean.

5.—Keep fowls and hen house free from lice.

6.—Use intelligence, system and energy. No paying result can be obtained from any department of the farm without earnest, well directed effort.

A. G. GILBERT

Experimental Farm }
Ottawa 25 August 1898. }

The Dairy.

THE EFFECT OF FOOD ON MILK PRODUCTION

I should be sorry if the discussion on this subject should be closed in the *Agricultural Gazette* in its present stage. May I earnestly appeal to the Professors of Dairy Chemistry to show practical men the true position in which dairy farmers stand before our public analysts?

For myself, a mere layman, who for fifty years past have been satisfied by estimating the effect of food on milk by actual results, I must be allowed to repeat what I ventured to assert some years ago: "If chemistry tells us that food does not influence the quality of milk, then chemistry tells a lie." Mr. Primrose McConnell, like Luther, has given an exposition of his faith in certain theorems. These theorems are now before the readers of the *Gazette*, and they seem to me to invite two remarks. First, they mutually contradict each other, *e. g.*, Theorem I. declares "the food does not appreciably or permanently influence the proportion of food and other solids in the milk." Theorem V. declares "succulent foods, will, in my opinion, lower the proportion of solids in the milk, especially the butter-fat." Second, when the contradictions contained in the six theorems are collocated

ated in parallel columns, there are more statements for than there are against the proposition "that food does influence the quality of milk." Indeed, I feel myself absolutely in accordance with Mr. Primrose McConnell when he declares in Theorem VI. "You may have no end of variations in the milk, all due to the food."

These variations show themselves in the manufacture of butter, in the manufacture of cheese, and in the sale of new milk. I have not so implicit a belief in chemistry as I have in Euclid. The "Elements" of Euclid have stood the test of more than 2,000 years. If I place a proposition of Euclid before an examinee to be worked out, and his working shows an absolute absurdity, it is not Euclid who is in fault but the false worker. When I have placed before me an analysis of milk from certain cows which have for some considerable time been fed on foods which practice tells me give forth rich milk, my expectation is to find rich milk. If a second analysis be taken after the same cows have been for a considerable period fed on poor food, I expect comparatively poor milk. As I drink milk every morning at breakfast, I take my own taste as a criterion of quality. The milk-pans from which cream is taken for the daily use of my family—offer criteria of quality which only those who have no eyes can fail to recognise. Cows grazed on the pastures of Mid-Staffordshire give milk from which excellent cheese is made. But these same cows grazed on the pastures of certain districts in Leicestershire give milk from which superexcellent cheese is made. I do not believe that a competent analytical chemist can give me identical analyses of these milks yielded by the same cows under similar conditions, the grass of the pastures being only excepted. I do not attack chemistry any more than I attack Euclid when, in the highly improbable event of the analyst giving me identical results, the note made by myself is similar to the note made in Euclid: "Which is absurd."

Let me give the most recent illustrations which have come from my own experience. I am now a milkseller, and not a cheesemaker or a butter-maker. Under my contract with a London buyer I undertake to supply milk of a much higher standard in fat and other solids than what is called the Somerset House standard. Quite exceptionally in my practice, I ceased to give, during May and June last—in consequence of the boom caused by the corner in American wheat—any other food

than the abundant grass of the pastures. My household milk and cream proclaimed their comparative poverty, of which I was frequently reminded. Then came a reminder from my London buyer of milk, backed up by several analytical statements, which showed that the quality of my milk, although considerably higher than the Somerset House standard, was decidedly lower than that specified in my contract. With the fall of Leiter came the opportunity of again buying my favourite foods of decorticated cotton cake and maize. It is not necessary to add that no damaging analyses have been sent to me since these foods have been again in regular use.

Let me now pass from the personal and somewhat egoistic narrative of my own experience to a wider field of vast importance. It would ill become me to assert that the science of chemistry is not abreast with the practice of experienced dairy farmers. Like Mr. Primrose McConnell, I have my doubts. And it is no laughing matter. On chemical analysis the milk trade, as at present conducted, is dependent for its character. If—and the if is too big for me to swallow—the general result given by chemical analysis puts all cattle foods on the same level as milk producers, I have to say that it is a *reductio ad absurdum*, and that no standard of legality ought to be founded on it. Let me conclude with an anecdote. Some years ago I was sitting by the side of the late Dr. Voelcker during the discussion which followed a paper on silage by the late Mr. Jenkins, Secretary of the Royal Agricultural Society of England. A speaker had been declaring that you might put rough grass, *et hoc genus omne*, into a silo, and that it would come out good food. Waving his arm with an emphatic gesture, which placed my head in danger, Dr. Voelcker burst out with "If you put rubbish into a silo I will stake my professional reputation that it will come out rubbish." It is "bad for the coo" to expect her to give the same sort of milk when badly fed as when well fed.—*English Agricultural Gazette.* T. C. S.

ABOLITION OF SMALL FACTORIES

MR. BARNARD.—If you will allow me, I will repeat for the sixteenth time what I said at the first meeting of our Association. There is a remedy applicable to the evil of these small factories, and a very simple one. I think, Mr. Chair-

man (M. J. C. Chapais), that you ought to know what it is, as you paid for learning it. It is the cartage of the milk.

The Chairman can tell you that, sixteen years ago, a creamery was established in small parish below Quebec, in a place where the most influential men of the district said: "Don't come talking about this here. You won't succeed. Every farmer here lifts his cow up by the tail when spring comes; and under such conditions there is no use dreaming of dairying, etc., etc., etc."

There is now in that parish a thriving combined factory, which has existed for sixteen years, and which must have paid for itself over and over again, and not only that, but it has given good dividends to its owners. And how has it been done? By encouraging the poor and the rich alike to send their milk to the factory by carting it thither for them.

This is no new thing; we have learned it from Ontario and the States. I should like to draw your attention to this point once more. I am growing old, and I cannot go on repeating the same thing to you for another sixteen years: I want to make you understand that experience gained in this province proves that success lies in the carting of the milk by the factory.

We have here for instance, a farmer who lives two or three miles from the factory; his cows are falling off in yield, his neighbours are in the same quandary as he, and they begin to say among themselves: "It is not worth while to go on drawing milk to the factory, it is too far off, etc." Plenty of the neighbours say the same; consequently, for want of milk the factory is obliged to end the season; while if the factory carts the milk, the farmer has nothing to trouble himself about, except to receive his money once a month. This he finds to be very handy; he can devote himself more to the care of his herd, and each man finds himself all the better for it.

I think this ought to be the first remedy to be tried, and the more the patrons strive to obviate opposition, the less difficult will its application be. We are agreed in this: that the cause of so much bad butter and cheese being made lies in the small factories, that want the capital and resources needed to produce first-rate goods. Competition is the cause of dairying falling off at the very moment when its products ought to be super-excellent.

It is, then, important to study the project of

establishing co-operative associations now submitted to us. It is to the interest of each of us; if we want to make money out of dairying, it is clear that it is to the interest of each individual. The object is to improve our factories so as to get the highest possible price for our goods, a question of the highest importance.

You have just been shown how, out of a capital, not paid in, but simply subscribed, a net profit of \$600 may be realized; a profit equal to 33 per cent on the subscribed capital. You see at a glance how profitable such a transaction must be.

There is no objection to the intervention of the law, but I know how difficult it is to get the law into operation when it effects the liberties of trade; and why not make use of the more simple means that we have at our command? The whole winter is before us in which to do that which has been done at St. Hénédine. You have been shown profits in hard cash made where no hard cash was expended. People are not much inclined to create troubles for themselves to prevent money from running after them. If I have any advice to give you it is to do what has been done at St. Denis and Ste. Hénédine, that is, let the factory undertake the cartage of the milk.

Mr. CHAGNON.—But if the farmer will not agree to this, how then?

Mr. BARNARD.—It has been proved that farmers only cart their milk themselves when they cannot avoid it. Let the factory do the cartage, and you will soon find that the extra quantity of milk delivered will repay you for the out-lay.

Mr. CHAGNON.—I have offered to pay for half the cost of carriage.

Mr. BARNARD.—If you had offered to pay for the whole no one would have objected, and you would have made money.

After a very warm discussion between MM. Taché, Grignon, Haven, Dumont and others on co-operative associations, their working, and the profits to be made by them; a discussion which the short-hand reporter could not take down.

Mr. TACHÉ rose and said:—I should like to propose that a committee be appointed to study a bill on the basis that I have described, but I shall not do so now. I withdraw my proposal, and shall not submit it till to-morrow.

Mr. BARNARD.—Do you think, Mr. Chairman, that there could be any successful opposition to your St. Denis factory?

Mr. CHAPAIS.—It would be difficult.

MR. DUMONT.—How much does the cartage of milk cost you ?

MR. CHAPAIS.—\$600 a year.

MR. DUMONT.—Do you hire your neighbours to do the cartage ?

MR. CHAPAIS.—We have six vehicles on the road.

MR. BARNARD.—Does it pay ?

MR. CHAPAIS.—Yes ; but it is said not to pay.

The session was then closed at 5 p.m.—*From the French.*

A Convincing Experience

For years, *Hoard's Dairyman* has urged upon its readers the value of raising a plentiful supply of oats and peas for cows, either as a hay or for the grain alone. It has also repeatedly affirmed that it considered timothy hay not a profitable feed for milk, particularly so long as there were so many people who thought it the best hay in the world and would pay the highest price for it.

The following experience recorded by H. L. Blanchard, of Hadlock, Wash., in the *Pacific Coast Dairyman*, is a bit of testimony right in line with the *Dairyman's* convictions :

For the last ten years, the writer has been seeking after that particular knowledge so well calculated to inspire confidence in one's self in the most economical feeding of dairy cows. I realize that this is a matter that each dairyman must largely settle for himself. The practice and advice of others can only be safely used by us as a guide. But this, like other problems, when mastered, appears to be very simple. Its solution calls for pluck, application and good common sense. It calls for a thorough understanding of the various kinds of soil of which the farm is composed, and the crops which they are peculiarly well adapted to grow. In other words, the dairyman must be a good farmer. He must also be a good judge of cows, and familiarize himself with the individuality of each cow ; he must know her likes and dislikes and must cater to them. All this requires years of study, toil and close observation. There is no cross-cut road to the end. Each of us by our experience must carve out his own success. Personally, I have found the experience of others, as appears in the dairy press, to be my greatest help and guide. I have always taken pains to study the mistakes, as well as the successes, of others, and find them quite as possible.

As I am credited with having met with fair success with the dairy, and have been earnestly requested to write up my experience, and practice in that line, for publication in the *Dairyman*, I modestly do so.

For several years my practice was, as fast as an acre was cleared and ready for the plow, to plant potatoes, sow oats and wheat and seed down to timothy and clover, always having a small patch of mangels each year. In a very few years, the timothy would naturally gain possession of the soil, and as a result, in the fall my barns would be filled with nice hay, mostly timothy ; my oats and wheat hay would be hauled in last, and fed out first, in connection with a few roots and a very little bran. About the time the oat hay and roots were all fed out, bran, chopped feed and oil cake would be substituted and fed with the timothy and clover hay. As a result, my cows would never quite average a pound of butter a day, and toward spring would become quite sleek and fat, and be making much less butter. The grain feed would vary from eight to twelve pounds with different cows, being governed largely by the quantity of milk given by each cow. The cows were turned out to water about ten o'clock a. m. each day. If the weather was mild they were left out until four o'clock p. m., but were never allowed to remain out in a storm. Under this practice, I would feed grain, as stated, about five months each year. It would take not less than one-third of the proceeds from the sales of butter to pay the grain bill for these five months. This practice I regarded better than not to feed grain at all, but at the same time it was not satisfactory.

Two years ago, I sowed about two acres of peas and oats and cut them for hay when the oats were nicely in the dough stage (1). Cured same in the cock about as I do clover. I also grew one-half acre of the improved white carrot that gave a good yield of roots. The peas and oat hay and the carrots, with a little bran added, supplied feed for the cows for the months of November and December. The daily ration consisted of from ten to fourteen pounds of peas and oat hay ; fifteen pounds of carrots and from three to four pounds of bran.

About January 1st, I began feeding all the bright timothy and clover hay the cows would eat up clean, twenty pounds of mangels, six to eight

(1) The better mixture is 2 bus. of oats, 1 of peas, and 1 of vetches, to the imp. acre.—Ed.

pounds of bran, two to four pounds of chop and one pound of oil cake. Of course, I approached this change of feed gradually. My cows at once dropped down in their butter more than one-quarter of their previous yield. It then became clear to me that the bugbear feed bill could be largely cut down. I saw that I must discard my timothy hay and grow peas and oats for hay instead, also enlarge my acreage of roots.

Accordingly, last winter I plowed up my meadows mostly, and in the months of March and April sowed peas and oats for hay—about one sack of each to the acre. I sowed the peas before harrowing, then the oats and rolled well. I also planted four acres of roots, mostly carrots. I reserved one meadow of about four acres of mixed grasses, no timothy. From these crops I am now feeding liberally, but not wastefully, and have adopted the following ration, viz.: Four to six pounds of mixed meadow hay, ten to fourteen pounds peas and oat hay, forty to sixty pounds carrots, and three to four pounds bran; a sprinkling of salt with each feed.

The cows are turned out for water twice a day, 9 a. m. and 4 p. m., and are at once returned to the stable, when they get their feed of mixed meadow hay.

As a result, the butter yield is now averaging one and one-quarter pounds per cow per day right along; the cows are in excellent working condition for a dairy herd, and instead of its taking one-third of the returns from the sales of butter to pay the monthly feed bill, it has only required less than one-sixth of such sales to pay for the bran. This expense must still be cut down. Bright clover hay, I think, will do it.

My motto for 1898 is—an abundant supply of peas and oats, clover and carrots, and I do not intend to buy much bran at \$18 or \$20 per ton.

How Food Influences Milk

Prof. H. H. Wing, of Cornell University, writing to the *Rural New Yorker* on this subject, says:

There is no doubt that the flavor of milk is largely influenced by the food that the cow eats. Ensilage, corn meal, beets, clover, turnips, onions, grass, all exert an influence upon the flavor of the milk, varying in intensity under various conditions. The flavor of some of these foods is always

liked, while a few, and among them ensilage, impart flavors that are sometimes objected to and sometimes not. This objection may or may not be due to an unreasoning prejudice; it is an important commercial factor. If a man dislikes a thing, he will not buy it even though its intrinsic value be unimpaired. I do not know that milk strongly tainted with garlic is not just as good for food as that most delicately flavored with the finest grasses, but it is unsalable, and the same holds with ensilage to those to whom it is objectionable.

It is not probable that the ensilage flavor is absorbed by the milk after it is drawn, if the latter is removed from the stable while still warm; but it is possible that the odor inhaled through the lungs of the animal may be diffused through the body, and so reach the milk. If the ensilage is of good quality, if the barn is kept reasonably free of the odor, and if the cows are fed immediately after milking, the amount of ensilage flavor imparted to the milk ought not to be objectionable to the reasonable consumer. That there are unreasonable consumers is undoubted, but let us hope that they will either discover reason or have to pay a good round premium for their milk.

The milk inspector of Grand Rapids, Michigan, has issued a decree forbidding the use of any form of preservative in the milk sold in that city, on the ground that such compounds are poisonous.

BETTERING AND MANURING OF PASTURES

The possibility of improving a pasture without breaking it up or without interfering with its being used, is undoubtedly a subject well worthy of consideration. Mr. Carruthers, who is one of the best authorities in England on the management of pasture lands, thinks it can be done by a skilful introduction of new plants into the pasture. But two considerations must be taken into account with regard to seeds sown. Only seeds of the best grasses and clovers should be used, entirely free from any trace of weeds, and not only so, the suitability of the seed with a view to its reaching the soil so that it may germinate should be taken into account. Where ground is more or less covered with grass, some of the seeds will be prevented from getting down. The seeds which are

least likely to be stopped in their fall to the ground are those whose coverings are not apt to catch, and a smooth hard, and for its bulk a weighty seed must be best for the purpose. Perhaps there is only one grass seed which nearly fulfils these conditions, and that is timothy, happily one of the best, as well as one of the cheapest of pasture plants. The clovers also nearly fulfill these conditions, and white clover is most important for improving a pasture (1). Such a grass as foxtail, though extremely valuable in a pasture, would be almost useless in sowing land already laid down, as its light seed, with its covering of silky hairs, would most probably prevent it reaching the soil, and it would never produce a plant. Cocksfoot (orchard-grass) is so valuable a grass that its seed should be tried to be introduced. The seed of yarrow should most certainly be used, as it is a very small and smooth seed and an important addition to most pastures, especially for sheep feeding.

In regard to the betterment of grass land by manuring, the farm-yard manure should be put on as early as possible, so that it shall not spoil the grass for grazing, and if some of it is a little rough it will have time to decay before the growth begins. It should not be hauled, when the ground is very wet and soft, or the cart wheels will cut into the turf and spoil the surface.

A heavy dressing should not be given to one part and a light one to another. If possible eight to ten tons should be given to the acre, as far as the manure will go. The fields that furnish meadow hay should be dressed before those that are to be only used for grazing, and it has been found that nothing gives such a good crop of hay as farm yard manure.

The manure if emptied down in heaps, should not be allowed to remain in that form more than a few days at the most, as it will make the surface very tender underneath, and when frost occurs afterwards it may reduce it to bear patches. Pig manure is always very strong, and if this is put on by itself it should not be applied more than four tons to the acre.

Fowl manure is also strong and burning if fresh, and it should not be put on grass, or anywhere else, unless it is mixed with double its own bulk at least of stable manure. Any road scrapings or

old soil that has been collected to go on grass should also be put on early. All the cleanings from ditches and waterways are most excellent to go on grass, and every particle of such should be spread out. Very often, material of this kind is allowed to remain in a heap or ridge for a year or two, when there is not half the quantity there was originally as it has decayed so much, and when kept so long it is very profitless. It should be put on when it is fresh and bulky, and before any of its qualities have had time to subside and escape. In many cases all farm yard manure is kept too long. It may seem right to put it on when it is nice and short, but it is not of half the value then that it was when it was fresh. (1)

Another fault which I may as well point out, is putting the manure on one part of the field year after year, and neglecting the remainder. The part nearest the manure heap is that which benefits most, but if a quantity of it was taken to the outskirts for a change the yield would be much more even and satisfactory.

W. R. GILBERT.

Swine.

THEO. LOUIS ON THE HOG.

Whenever that wise old German farmer delivers himself on the hog, it will pay everyone interested in hogs to stop and listen. What Uncle Theodore knows has cost him thought, labor, observation and hard experience enough to make it valuable to any farmer. In a recent letter to the *National Stockman*, he says :

The question "What ails my pigs?" is due, seven times out of ten, to injudicious feeding, and often a want of knowledge; and three-tenths to bad management and care. There are men that say that agricultural papers are simply a repetition, they cannot afford to read them, but the knowledge of such repetition would have saved loss of time and money.

The writer turned over some leaves in the *Manual of Veterinary Hygiene*, by Fred Smith, M. R. C. V. S., saw the following that will be worthy to re-

(1) In more soils, a slight dressing of lime will bring up plenty of white clover. Ed.

(1) All depends upon pressure of weed-seeds and treatment.—Ed.

peat: "An excess of food leads to disease of blood, liver and bowels. Only a certain amount can be absorbed by an animal, and all over and above this lies in the intestinal canal to undergo the process of putrefaction, attended with elimination of gases, which of themselves becoming absorbed, may produce serious changes in the blood, in addition to excess of feed already in the tissues. The undigested food produces diarrhoea, intestinal irritation, the evacuations would appear to be more marked with some grain than others."

This ought to solve the hidden mystery to some man that writes a postal card, "What ails my pigs? They are lame in the back, have lost the use of the hind legs, or they are dizzy, stiff, foam at the mouth. Write to me by return mail, and give cause and remedy." The above repetition, and others similar, if heeded, would solve and prevent those sudden mysteries.

Many farmers have no place to keep their milk or swill warm, or from freezing. The writer learned from a Swede, in the Red River Valley, where the winds have sweep from the North Pole. He enclosed the barrels in a frame of boards, leaving eighteen inches space. This, and underneath the barrels, he filled with the droppings of horses without straw, stamped firm and hard. He patronized a creamery, and when I tested the milk on a morning of 23 degrees below zero, it tested 67 degrees.

Some one may have non-breeding sows that will not become impregnated when served. Give them daily a gill of fine ground hemp seed, in dry meal of corn and shorts, or ground feed. The late D. L. Thomas reported, in his day, good results, and we have tried it with equally good results.

Sometimes, and pretty often, too, one sees one fattening hogs on ear corn, and that alone, and all the feeder seems to think about, is, to give plenty, don't seem to think about if they are cold or warm, have clean, dry sleeping places. Never takes notice that their voidings are filled with un-masticated and undigested corn, that the power of assimilation and digestion is lessening with the advanced stage of fattening, that grinding, and a change to variety, would add materially to his profits. If he were the possessor of a pair of scales, and passed certain of the animals over them once a week, he would be astonished at the small results that were deceptive to the eye.

I do not mean that they should be pampered,

and valuable time spent without compensation, but to receive full return for labor and material. I so often notice that shoats spend days and weeks, when the inclemency of winter weather arrives, when their nights and days are misery, and that in such instances they not only give no return for food, but virtually lose weight, when a day or two spent, with some cheap material, would erect shelter to obviate all this for several years. There seem to be an impression that in swine feeding systematic work thought are not essential.

There is another item of great importance in swine husbandry on the farm. That is manure saved and lost. And I want to impress on every beginner its importance. The fact is, that once the conviction takes hold of one that there is not much in it and of it, he will feed thousands of bushels of grain from which he will have no return whatever, and never in his days the loss will occur to him, and seldom ever on such a farm a system of saving the manure of hogs will be established.

When we look over our sandy farm, now under cultivation forty years, which had been reduced by cropping and selling of grain in the early years, or what I call selling the farm in half bushel measure, when it took heroic efforts to produce a clover blossom where are now blooming fields of clover, and produced last year 100 bushels of ear corn to the acre, by actual measure, from the several fields, and say that these great achievements have been made by systematic saving of manure indirect from yards and stys, and direct by pasturing, I do not blush to advise the careless, unthinking. But facts and figures, such as Director C. A. Goessman, of the Amherst Experiment Station, Mass., produces, of the manurial value connected with swine feeding, ought to stimulate the most careless and unconcerned. When six pigs, from the average weight of 30 pounds to the weight of 182 pounds live weight, produced \$10 worth of manure by actual chemical test, will it not make some one think and blush?

Some of our readers may ask what is meant by "\$10 worth of manure by chemical test?" It is this: Those six pigs in feeding from 30 pounds to 182 pounds, produced as much nitrogen, phosphoric acid and potash in their manure, by "chemical test," as would have cost \$10 in any of the fertilizer markets in the country. One man, in this county, said to us not long ago, that there

was such a thing as getting rich by increasing the productive power of the farm. He was right. Thousands of farms in this part of Wisconsin will produce a third more of any crop than they did 30 years ago. Dairying has done it. Buying lots of bran, raising clover, making lots of manure. The man who does not keep up the fertility of his farm is constantly growing poorer, even if he has money in the bank.

HOARD.

Our Exports

QUALITY ALL IMPORTANT WITH THE BRITISH CONSUMER.

In discussing Professor Robertson's visit to Great Britain and the developing of that market for Canadian farm products, our English correspondent points out that quality is the important thing to be considered. This fact cannot be too strongly impressed upon the producers of this country. No matter what the article is, if the quality is not the best it is only a waste of energy to try and export it at a profit. The British consumer is very particular about the quality of the food he eats. In fact no other people in the whole world give so much attention to the nature and quality of the food they eat as do the great consuming classes of the Mother Country. Other producing countries recognize this fact and so must the Canadian producer if he wishes to obtain a profitable market for his products in Great Britain. The British consumer may be imbued with a strong love for every portion of the great Empire to which he belongs, but his convictions in this particular are not strong enough, nor will they ever be strong enough, to induce him to purchase an inferior quality of food products from one of her colonies when he can get a better quality elsewhere. Nor must the Canadian producer run away with the idea that the growing popularity of Canada and things Canadian in England during the past year or two will enable him to palm off any kind of a product upon the consumer there. All that we have a right to expect is, that, if our products are equal in quality to those produced in a foreign country, he will give us the preference over the latter when buying. To get him to do this, however, we must be in a position to assure him that the quality is

right and always will be right. If we deceive him once on this point it may be a very difficult task to regain his confidence.

Another important point touched upon by our correspondent is the establishment of a permanent Canadian exhibition in London. Through the efforts of the Hon Mr. Fisher and Professor Robertson this is likely to be done. The establishment of a permanent exhibition of Canadian food products in the business centre of the great metropolis should prove an excellent medium for reaching the dealers who cater to the consuming classes in Great Britain. It would be a means of advertising Canada and her products in every part of the United Kingdom. The provision dealers in the provincial cities and towns frequently make trips to London in the interest of their business, and if the exhibition were well advertised throughout the country, many of them would visit it on such occasions. There are many other ways also in which a permanent exhibition of this nature would be useful and effective in placing Canada and her products prominently before the British consumer.—*Farming*.

OUR BRITISH LETTER

PROF. ROBERTSON IN ENGLAND. QUALITY THE IMPORTANT THING IN THE BRITISH MARKETS. A PERMANENT CANADIAN EXHIBITION.

London, Eng., July 21st, 1898.

Professor Robertson is now in England, and some of us have again had the pleasure of seeing and talking to him on the work he and the Dominion Government are attempting in the way of capturing the British markets. Some of the papers have said that "Canada is determined to become John Bull's 'home farm' over the water." Well, we are very glad to think and know there is a fair modicum of truth in the playful assertion. We are glad to know that Canada is attempting to take a share of our market profits, *i.e.*, providing we don't produce, ourselves, sufficient for our own requirements and, of course, we don't do so.

Mr. Robertson has been explaining how sedulously the Canadian Government considers the interests of its farmers and how industriously it cultivates British markets, and in this he secures a grand advertisement for Canadian produce—an essential nowadays even with a tip-top commodity

One of our daily papers goes on to speak as follows : "Although much has been done, the Dominion is just beginning its career as one of the great granaries, orchards and dairy farms of the Empire. Canadians are concerned with only one market; they concentrate all their efforts to secure our patronage. As a mere example of beneficent government assistance, the system of agricultural education followed is a great achievement; as a piece of organism it is marvellous, as we have this immense territory, with its scattered population knit together with a series of links which establishes complete connection between the producer in the far North-west and the consumer in England with the fewest possible intermediaries; not less significant is the effect of all this in cementing the commercial bond between the motherland and her premier colony, and in increasing our common interests."

I will only add one thing to all that Professor Robertson has been saying (although I know the lesson implied thereby is already being enforced by the various agricultural experts in Canada), and that is, that to secure, and to retain, our market—a great and growing one—the great point to be arrived at is *quality*. If that be good, and if farmers are content to take a moderate profit for their wares, they will not be disappointed in achieving pecuniary success—the end of all their strivings.—*Farming*.

NOTES ON RECENT AGRICULTURAL CHEMICAL RESEARCH

DR. C. M. AIKMAN.

The nature of the micro-organic life infesting horse manure, as also the functions performed by these minute forms of life, in its disintegration and decomposition, have recently formed the subject of investigation by Professor Severin in Russia. During the course of these investigations the experimenter succeeded in isolating no fewer than twenty-six different species of bacterial life from horse manure, of which twenty-four were aerobic (*i.e.*, requiring the presence of air for their development), while only two were anaerobic (*i.e.*, developing in the absence of air). Of the two anaerobic varieties, one proved to be that giving rise to tetanus or lockjaw. Experiments were also simultaneously pursued with regard to the nature

of the influences at work in the decomposition of the manure. In one experiment the manure was allowed to decompose under the influence of the air alone, and with the exclusion of bacterial life; while in another the decomposition was allowed to proceed with both agencies at work—*viz.*, the presence of air and also of micro-organic life. From the results Professor Severin concluded that the decomposition of the manure was almost entirely due to the agency of bacteria, and was only to a very slight extent influenced by the direct oxidising action of the air. By raising the temperature sufficiently high to retard the action of the bacteria, the purely chemical oxidising influence of the air was only increased three and a-half times, while, on the other hand, the decomposition due to the germ life was decreased to the extent of seven and a-half times.

The results of Professor Déherain's examination of the drainage waters from the soils of the experimental station at Grignon have recently been published; and it may be well to cite one or two of the more outstanding of these. During wet years, the amount of nitric nitrogen in the drainage water from uncropped fallow soil was found to amount to as much as 180 lb. (equal to $9\frac{3}{4}$ cwt. of nitrate of soda, or $7\frac{1}{2}$ cwt. sulphate of ammonia). This, it may be pointed out, exceeds the requirements of even the most exhausting crop; and strikingly demonstrates the ruinous loss of a most valuable fertilising constituent, when land is permitted to remain under such conditions. On soils where crops were being grown, very much less nitrogen was produced by the process of nitrification, which was due to the fact that the rapid evaporation of water from the plants so exhausted the water of the soil that there was not sufficient moisture left to permit of active nitrification. One striking result of these investigations might be specially adverted to—*viz.*, that in wet seasons soils bearing crops, even where no manure was applied, produced good crop, which contained decidedly more nitrogen than that produced in the uncropped fallow fields during the same period. Professor Déherain concluded that, although a considerable amount of the nitrogen of soils is in an unavailable form, the nitrifying bacteria are capable, if sufficient moisture is present, of rendering this nitrogen available for the requirements of even the largest of crops.

(To be continued.)