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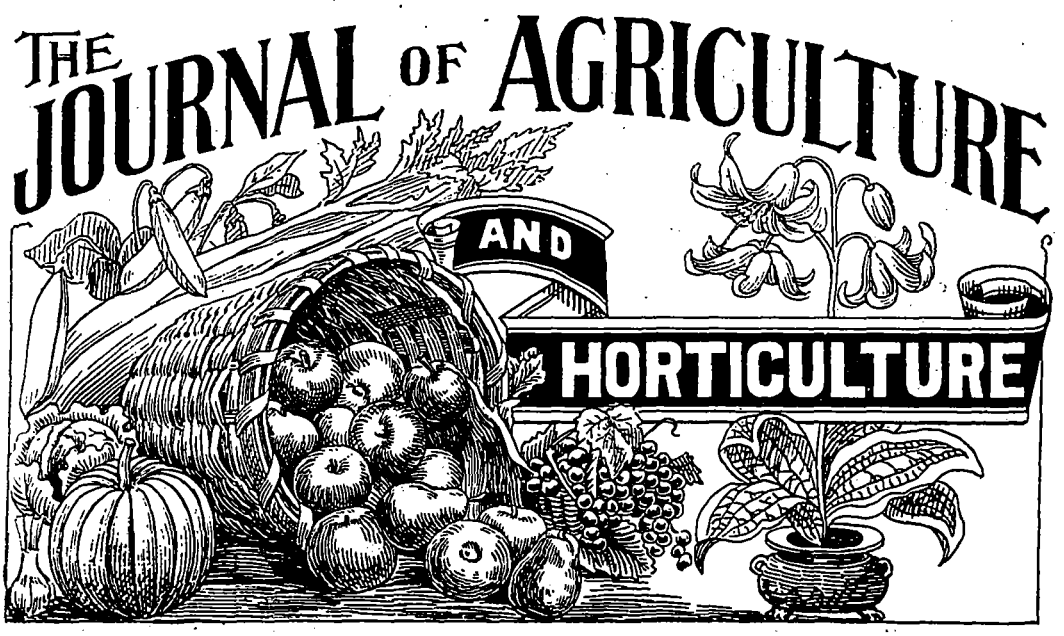

VOL. I. No. 3. This Journal replaces the former "Journal of Agriculture," and is delivered free to all members of Farmers' Clubs. FEBRUARY 1, 1898.

Official Notice

Assembly Bill No. 23.

An Act to further amend the law respecting farmer's clubs.

HER MAJESTY, by and with the advice and consent of the Legislature of Quebec, enacts as follows:

1. Article 1670 of the Revised Statutes, as replaced by the act 56 Victoria, chapter 20, section 7, is again replaced by the following:

"1670. If two societies, organized in one and the same county, raise together a sum exceeding eighty dollars, the grant shall be divided between them in proportion to the amount subscribed and paid by each; and, if on the first day of September of any year, or within the following thirty days only one of the said societies have acted in conformity with the preceding article, it shall have the exclusive right to the entire grant in proportion to the sum subscribed by the members, provided always, that when any one of the societies shall have raised a sum sufficient to entitle it to half the grant, the said half shall be paid to it, without any deduction being made, even when the other society shall have raised a larger amount of subscriptions."

2. Article 1675*c* of the Revised Statutes, as enacted by the act 56 Victoria, chapter 20, section 10, and amended by the act 57 Victoria, chapter 18, section 1, is again amended by striking out the fourth clause thereof.

3. Article 1675*w* of the Revised Statutes, as enacted by the act 56 Victoria chapter 20, section 10, is replaced by the following:

"1675*w*. The directors shall, whenever the Commissioner of Agriculture deems expedient, convene a general meeting of the members of such club to whom lectures on agriculture shall be given.

The public shall be admitted to such lectures.

In default of holding such meetings when required by the Commissioner of Agriculture, the provincial grant may be taken away.

During the fifteen days following such meeting, the president and secretary shall sign and transmit to the Commissioner of Agriculture a report setting forth the date of the meeting, the name of the lecturer or lecturers, the subjects dealt with and the approximate number of persons present."

4. Article 1675*ii*. of the Revised Statutes, as enacted by the act 56 Victoria, chapter 20 section 10, and amended by the act 57 Victoria chapter 19, section 1, is replaced by the following.

" 1675*ii*.". Each club is entitled to an annual grant of fifty cents per member, taken from the sum of fifty thousand dollars devoted by article 1667 to the payment of grants to agricultural societies; and every member is further entitled to receive the *Journal of Agriculture and Horticulture*.

Nevertheless no club shall receive in one year less than twenty-five or more than fifty dollars in addition to the *Journal of Agriculture and Horticulture*."

5. Article 1675*jj* of the Revised Statutes, as enacted by the act 56 Victoria, chapter 20, section 10, is repealed.

6. Article 1675*mm* of the Revised Statutes, as enacted by the act 56 Victoria, chapter 20, section 10, and amended by the act 58 Victoria, chapter 24, section 2, is repealed.

7. Article 1675*nn* of the Revised Statutes, as enacted by the act 56 Victoria, chapter 20, section 10, is amended, by striking out all the words after the word " Commissioner " in the third line.

8. Article 1675*vv* of the Revised Statutes, as enacted by the act 57 Victoria, chapter 19, section 2, is amended, by striking out the second paragraph thereof.

9. Article 1675*ww* of the Revised Statutes, as enacted by the act 57 Victoria, chapter 19, section 2, is amended, by replacing the words: " which form the basis of the amount of the grant to which it is entitled," by the words: " paid by its members."

10. This act shall come into force on the day of its sanction.

Competition of Provincial Agricultural Merit.

EIGHTH YEAR, 1897

AGRICULTURAL DISTRICT No. 3

List of the Laureates.

ORDER OF MERIT.	NAMES.	ADDRESSES.	COUNTIES.	M'KS.
	For the Gold Medal:			
No. 1	Charles Boutet	Victoriaville.....	Arthabaska.....	94 70
2	H. R. Mooney.....	Inverness	Megantic.....	93 70
3	Rémi Belles Isles.....	St. Fabien.....	Rimouski	89 25
4	Louis Kirouac.....	Warwick	Arthabaska.....	87 55
5	Ls. B. Belles-Iles.....	St. Fabien.....	Rimouski	85 00

ORDER OF MERIT.	NAMES	ADDRESSES	COUNTIES	M'KS.
	For the Silver Medal:			
6	J. E. Roberge	Lambton	Beauce	89 10
7	J. F. Descoteaux	Sainte Monique	Nicolet	87 90
8	Désiré Bégin	Sacré Cœur	Rimouski	87 55
9	Sam. Edwards	Inverness (Irvine)	Megantic	87 15
10	Gabriel Dumont	Sainte Hénédine	Dorchester	86 95
11	Dme Vve C. A. Collet	Saint Henri	Levis	86 20
12	Onésime Lupien	St. Valère de Bulstrode	Arthabaska	85 30
13	Germain Caron	Trois Saumons	L'Islet	85 00
	For the Bronze Medal:			
14	J. D. Morin	St. Elizabeth d'Auteuil	Arthabaska	83 75
15	Alphée Denault	Lambton	Beauce	82 75
16	Rémi Bolduc	Saint François	Beauce	82 10
17	Joseph Chenard	Bic	Rimouski	82 10
18	Hamilton Canning	Inverness	Megantic	82 10
19	Alfred Gamache	Cap St. Ignace	Montmagny	81 40
20	Joseph Bolduc	Saint François	Beauce	81 20
21	Adolphe St. Laurent	Walkers Cutting	Arthabaska	81 00
22	Sylvio Pelletier	Fraserville	Temiscouata	81 00
23	Chs. Hamel	Saint François	Beauce	80 90
24	F.-X. Desrochers	Warwick	Arthabaska	80 05
25	F.-X. Marcoux	Saint Albert	do	78 75
26	Samuel Belles-Iles	St. Fabien	Rimouski	78 25
27	Ludger Deshaies	St. Wenceslas	Nicolet	78 25
28	Rezenne Baumier	Warwick	Arthabaska	78 20
29	Adolphe Beaulé	Lambton	Beauce	77 75
30	Hyacinthe Lauzé	Lotbinière	Lotbinière	77 60
31	Romuald Paradis	St. Paul de Chester	Arthabaska	77 50
32	Louis Patry	Weedon Station	Wolfe	76 45
33	J. N. Fortin	St. Fabien	Rimouski	76 35
34	Alfred Turgeon	Lambton	Beauce	76 15
35	Joseph Gosselin	St. Henri,	Levis	75 95
36	Edward O'Mally	Inverness	Mégantic	75 65
37	Nazaire Plourde	St. Wenceslas	Nicolet	75 50
38	Solime Bourbeau	St. Christophe	Arthabaska	75 30
39	Ambroise Thibault	Walker's Cutting	do	75 25
40	Henri Bélanger	St. Valier	Bellechasse	75 15
41	Louis Hamel	St. Henri	Levis	75 10
42	Charles Bolduc	St. François	Beauce	75 10
43	Jacques Collin	St. Thomas	Montmagny	75 05
44	Alphée Laliberté	Lotbinière	Lotbinière	75 00
	For the Diploma of Merit:			
45	J.-B. Lagacé	Bic	Rimouski	70 40
46	François Désilets	St. Wenceslas	Nicolet	68 75
47	Léger Corriveau	St. Valier	Bellechasse	67 85
48	Hercule Therrien	St. Clotide	Arthabaska	67 50
49	Hugh Maxell	Inverness	Megantic	65 50
50	Louis Roux	St. Norbert	Arthabaska	65 35
51	Thomas Lessard	St. Joseph	Beauce	65 35
52	Jos. Eloi Jalbert	Cap St. Ignace	Montmagny	65 30
53	Jules Landry	St. Valere	Arthabaska	65 25
54	Georges Boulet	Cap St. Ignace	Montmagny	65 10
55	J. W. Mooney	Inverness	Megantic	65 10
56	Alex. Millier	St. Elisabeth d'Auteuil	Arthabaska	65 05
57	Stan. Tourigny	St. Wenceslas	Nicolet	65 00
58	Paul Tourigny	Victoriaville	Arthabaska	65 00
59	Pierre Thibaudeau	Stanfold	do	65 00
60	S. R. Gillis	Inverness	Megantic	65 00
61	Philippe Brassard	Nicolet	Nicolet	65 00
	Entered not for competition:			
62	Etienne St-Cyr	St. Valère	Arthabaska	62 60
63	Honoré Lessard	St. Joseph	Beauce	60 80
64	Ferd Brisson	Stanfold	Arthabaska	57 75
65	Frs. Fleurant	Ste. Clothilde	do	57 55
66	Edmond Poudrier	St. Paul	do	52 60
67	Pierre Bernier	St. Elisabeth	do	50 50

Visits to the Farms

Entered in the competition of Agricultural Merit, 1897.

No. 1.—CHARLES BOUTET.

On July 15th, 1897, we visited the farm of Monsieur Charles Boutet, at Ste Victorine d'Arthabaska. It contains 191 arpents (1), of which 125 are under the plough, nearly 66 in bush, and 1¾ in garden and orchard.

ROTATION.

1ST YEAR.—Mr. Boutet begins his rotation with a bastard fallow, on meadow or pasture, as the case may be, and on it sows hoed-crops and green fodder with manure.

2ND YEAR.—Wheat, barley, etc., with clover and timothy.

3RD AND 4TH YEARS.—Meadow, followed by one or two years pasture.

Great care is taken to increase the quantity of manure; his system of farming is perfect, without, however, being intensive.

The farm is well divided into fields; and the fences are in good order. The farm-house is convenient and adapted to the requirements of a family.

Nothing can be better than the barn, and the buildings in general are well laid out, with a dung-pit, etc., etc. The silo M. Boutet has a high opinion of. A good ice house and a hot house complete this very perfect set of farm buildings.

Everywhere the management is good; still, some of the implements, especially the ploughs, might be improved upon.

The book-keeping is relatively well done, but Mr. Boutet would, no doubt, be glad of a set of blank account-forms, which would greatly lighten his burden in this respect.

As to permanent improvements, 5,000 loads of stones have been carted off the land, and used for bridges, drainage, buildings, fences, and in making a road across a swamp 4 or 5 arpents wide.

The water-furrowing is well done, as is the ploughing, though it is not quite perfect. (1)

About 8 arpents of land have been levelled and 12 arpents of ditches straightened. The ditches are made with the horse-shovel, and the earth turned over is used for various purposes.

We found more than 14 arpents of drainage, which must act well, to judge by its good effect on the land.

Five arpents of light soil had been covered with bog-earth, and the good grain-crops on them prove the utility of this admixture. Three arpents of buckwheat had been ploughed in, as amendment on heavy land.

Ninety bushels of lime had been put upon part of a piece of wheat, and the difference of the crop on the part so treated is very easily seen. Several experiments had been made with ashes and salt.

We saw considerable new plantations of forest-trees.

The stock is in part thoroughbred, in part being "graded up:" we allowed 12 out of 15 marks for it.

STATE OF THE CROPS.

In spite of the unfavorable weather of this year, as described by the people of the district, Mr. Boutet's crops are very good.

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(1) We may as well say, once for all, that the *arpent* is to the *imperial acre* as 11 : 13. Thus, 191 arpents are equal to 162 acres. ED.

(1) *Egoutter*—surface work; *drainer* is, of course, English. ED.

We found $8\frac{3}{4}$ arpents of fine wheat;
$2\frac{1}{2}$ " of barley;
17 " of oats;
6 " of oats and pease.

Of hoed-crops:

$1\frac{1}{4}$ arpents of mangels;
$\frac{1}{4}$ " of turnips;
$\frac{1}{4}$ " of swedes;
$\frac{1}{2}$ " of carrots;
$\frac{1}{8}$ " of tobacco;
$\frac{1}{2}$ " of corn for grain;
$1\frac{1}{2}$ " of corn for silage;
2 " of potatoes;
3,000 Cabbages;

besides a considerable quantity of parsnips, celery, salsifis, tomatoes, canliflowers; etc.

Fifteen arpents of green fodder were partly sown on meadow broken up on account of the damage done by frost in the spring; and $35\frac{1}{4}$ arpents of meadow were improved in early spring; by harrowing and sowing timothy, clover, tares and oats, with a partial light coat of dung, harrowed again and well rolled. Treated thus, all the meadows on this farm, in spite of the unpropitious spring, are as full of grass as they usually are in good seasons.

An orchard, $1\frac{1}{2}$ arpent in extent, and a superb garden, complete the tale. From this garden, Madame Boutet, whose energy and resolution cannot be too much admired, produces vegetables and fruit to the value of $300.00 a year. What a grand example!

It is pleasant to reflect that these good people began their career with no other resource than their indomitable determination. With their energy, regularity of life, and their promptitude, they now afford both, to their numerous and pleasing family and to the public, a fine pattern of prudent management.

We consequently allowed to Mr. Boutet 94.75 marks, with a diploma of "*Exceptionally distinguished merit*," which entitles him to a "*Gold Medal*," as well as to our warmest congratulations.

NOTES

Canadian Meat in England.—Mr. John Hobson says, in the French edition of the Journal.

I beg to tell you that the English entertain no prejudice against Canadian meat; there is only its quality that is concerned. The taste of the English is, as regards food-products, very refined and fastidious. If we can send them meat of as good quality as they find in their own stock, we shall get as good a price for it as their own farmers get.

Seed Grain.—We read, in a French agricultural paper, that "soils too rich in *humus* produce bad grain for seed." This is utterly opposed to our experience. Every one who knows the "East Anglian" counties of England will say that the finest *malting* barley is grown on the chalk-land of Essex, Hertfordshire, Suffolk, and the higher parts of Cambridgeshire. The lower districts of the last county are chiefly composed of drained fen-land, which is, of course, full of *humus*. The chalk-land farmers sell all their barley to the maltsters of Saffron-Walden, Bishop-Stortford, etc., and buy their seed-barley. To what market do they resort for it? To Cambridge market, where, any market day in February and March, scores of the Essex, Hertfordshire, etc., men may be seen, eagerly picking up lots of the fen barley, poor looking as stuff it is. Not necessary to say that its character is entirely changed at the succeeding harvest. The sort is right, of course: it is all "true Chevalier."

EVIDENCE OF PROFESSOR SHUTT

(*Continued*)

Mr. Shutt holds firmly the opinion that light land should receive frequent light dressings of rotted dung while heavy land may be treated to large doses of more recent manure at wider intervals. In this, of course, all practical farmers will cordially agree with him.

As to the length of time that it would take green manure to remain unassimilated in the ground, Mr. Shutt, very sensibly observes that it depends upon the greater or less quantity of straw in it, and the quantity of moisture in the land. Generally speaking, from three to six months would be about the time. As rotting proceeds, the manure will be decreasing in weight, losing its organic matter and nitrogen; but, to a certain extent, the percentage of nitrogen will increase. One hundred pounds of fresh manure will yield, when rotted, from 25 to 40 pounds; but, in this case, no precaution to keep the dung well compacted and moderately moist would have been employed.

"The resulting manure was about twice as rich in the elements of fertility as the fresh manure. Thus, we found that the percentage of phosphoric acid in the fresh manure was .32, and in the rotted manure it was .73. This goes to prove that under the conditions of rotting, in this investigation, the phosphoric acid had not leached out. In the fresh manure the percentage of potash was .76, and in the rotted manure it was 1.49, showing, as I have already stated, that weight for weight, rotted manure is much more valuable than fresh manure, and this is more especially true when care has been taken to prevent fire fanging and leaching.

Analysis of fresh dung, mixed horse and cow:

	Pounds per ton
Nitrogen	10.4
Phosphoric acid	6.2
Potash	15.2

A similar lot, thoroughly rotted, yielded:

	Pounds per ton
Nitrogen	17.76
Phosphoric acid	14.66
Potash	29.92

Well may the Professor remark: "These figures undoubtedly prove the superior quality of rotted manure. Further we have good reasons to suppose that the elements of fertility in the latter are more soluble and available than those in fresh manure." After all, is not the great loss of weight principally attributable to the escape of water from the dung?

Our old enemies, i. e., the pseudo-scientists, who tried to persuade farmers that the crystalline form of phosphate, finely ground, would be a most valuable dressing for their land, receive a complete quietus in the following paragraph:

PHOSPHORIC ACID IN MINERAL PHOSPHATE.

We made an experiment to ascertain if any of the phosphoric acid in ground "mineral phosphate" could be rendered soluble by mixing it with rotting farm-yard manure. You are probably aware that the phosphoric acid in mineral phosphate or apatite, is in an insoluble and therefore unavailable condition. When this material is treated with sulphuric acid, super-phosphate—in which phosphoric acid is soluble—is formed. It has been repeatedly urged that if the finely ground mineral phosphate was composted with actively fermenting manure, the same result would follow, namely, the rendering soluble of the phosphoric acid.

We took 50 pounds of apatite per ton of manure, allowing the mass to ferment from April to August. Further analyses were then made. They showed that no

phosphoric acid had been thereby rendered soluble. We, therefore, have very good proof for saying that the fermenting manure has no influence on this apatite."

We had hoped that the letters of Lawes, of Voelcker, and of Aitken, to the editor (v. 4, December, 1882) would have been enough to satisfy any one of the total uselessness of apatite until "treated with sulphuric acid." But it is astonishing how far personal interest will carry some unprincipled men. One of these, in 1881, went so far as to say that after having sprinkled, on his lawn at Lachine, some "very finely ground apatite, through the rose of a watering-pot." the effects were clearly visible, within three weeks after the application, by the marvellous growth of the grass! Needless to say, this man was in the artificial manure trade, and had an interest in a wonderful crushing mill or pulveriser.

CLOVER AS GREEN MANURE. — Whether it pays in a climate like this to expend any cattle food by burying it in the ground does not need any argument, one would think; and Prof. Shutt evidently agrees with us; for he says, in reply to a question, from Mr. McMillan: Where it can be fed to cattle, and the manure taken care of, feeding is the best method, because you get two profits instead of one.

Of all the clovers grown in this country, it seems that the Mammoth red-clover is second in value (1), and our favourite, *Alfalfa*, or as we prefer calling it, *Lucerne*, is the first (2). We do not believe that any one who has succeeded in getting a stand of Lucerne would be crazy enough to plough it in, unless, as Mr Shutt says, he has no stock to eat it.

Crimson Clover—*trifolium incarnatum*—is one of the most productive of our English fodder-crops, but it is comparatively worthless on account of the enormous proportion of water it contains:

Water in Alfalfa (Lucerne) roots	64.74
" " " stems and leaves	71.63
" " crimson clover, stems and leaves	83.82
" " " " roots	83.87

The following table shows the weight of crop per acre, and the amounts of the more important constituents per acre, of the two clovers, alfalfa and mammoth red:

	Organic matter	Ash	Nitrogen
Alfalfa, stems and leaves	2,664 lbs.	510 lbs.	75 lbs.
" roots	3,120 "	613 "	61 "
	5,784 "	1,123 "	1.36 "
Mammoth red	2,269 "	508 "	82 "
	1,409 "	219 "	48 "
	3,678 "	727 "	130 "

The roots were taken to a depth of two feet. We mentioned some months ago, that Mr. Bouthillier and the writer, at Ste Thérèse, traced the roots of Lucerne down to the depth of four feet, and then had not got nearly to the end of them. Given good light loam with no under-water, and we have no doubt that the roots of this clover will, like hop-roots, go down 18 or 20 feet into the subsoil.

(1) Not in weight per acre, seeing that the crimson clover far exceeds either. But, it must be remembered that one is an annual, and Lucerne lasts several years, and Mammoth-clover two at least. ED.

(2) We have known it called in France, "*Spanish Trefoil*," which is a free translation of the Arabic words *Al-falfa*, Al is the definite article. ED.

THE QUEEN OF AUTUMN.

The following did not reach us till some time after the Chrysanthemum Exhibition was held in Montreal; but, as it is so well calculated to instruct and interest our readers with regard to this magnificent flower, we give it a place in our columns, although late.

The title of "Queen of autumn" has most appropriately been given to that splendid flower the chrysanthemum, abbreviated by our American cousins to the inelegant name of "Mums"!

The flower is the national emblem of Japan, a sixteen petalled one being that chosen by royalty—The wonderful varieties in color and form, of the present day, owe their origin to that flowery land—should any of our readers have seen the grand display made last fall at the Windsor Hall by the MontrealGardeners' and Florists' Club their love of flowers should have been stimulated and their ambition perhaps roused to try and produce something similar.

As they are of comparatively easy cultivation, a few notes on their growth and a short notice of the exhibit aforesaid will doubtless be of interest.

It is not absolutely necessary to have a green-house to grow chrysanthemums, for any one with a large, sunny bay-window and proper treatment should succeed fairly well with a dozen or so plants—In the first place, take your cuttings in February or March; or better, split rooted slips from the old plants: pot into small pots when they have grown two or three inches, pinch them back, continue to pinch and repot into larger pots until the last week in July, when they will require help in the way of manure-water made from cow or sheep dung, weak at first and stronger as they gather strength and the pots fill with roots. For last potting use good strong loam mixed with one third old cow manure.

The pinching process applies only to bush plants, for single large blooms do not pinch them at all, or only once and when the flower buds make their appearance, nip them all off except the large centre buds: this disbudding is necessary if you wish for large flowers. Shading from the mid day sun is of advantage; also plunging the pots up to the rims in soil or ashes.

I take the plants with thin sticks or wire as they require support, and take them under cover before danger from frost makes its appearance.

As an artistic arrangement, the exhibition in the Windsor Hall gave splendid evidence of local Horticultural skill and enterprise, and on its success the Gardeners' and Florists' Club is to be congratulated.

To Mr. J. Bennett, florist, the credit of the grouping and arrangement of the exhibit chiefly belongs—In cut blooms, the judges, Messrs. Walter Wilshire and Eddy had a most difficult task,but performed it nevertheless, to the satisfaction of every one. Mr. T. McHugh, of the Forest and Stream Club, carried off first prize for the third time, and therefore, the club's silver cup; he had twenty four magnificent blooms, some of them *eighteen* inches in diameter? Mr. Geo. Robinson, gardener to Mr. Alfred Joyce, exhibited flowers which were a close second. In this class, the special prize for the finest bloom in the show was awarded to Mr. McHugh for a variety named, Mrs. Henry Weeks, a splendidly formed, pure white, broad petalled flower.—(Magnificent! Far finer than any of the fluffy giants. Ed.)

In specimen plants, Mr Geo. Robinson was first with twelve superb examples, most of them with over 100 blooms each; he also secured first prize for best plant on exhibition with a new beautiful clear pink, named Mrs Perrin: many thought that much better plants and flowers could have been found among the twelve, but we suppose that the new and blushing beauty of Mrs Perrin had its weight with the judges. In this class, fine specimens were sent by T. McHugh and George Stamford.—Mr. Charles Smith gardener to Mr. J. P. Dawes was a good second in the twelve and had

a splendid exhibit in other classes—Another successful grower was Mr. Pinoteau, city gardener, who took two first prizes for groups, one all chrysantemums and the other mixed with palms and ferns.

Mr. Colin Campbell had two very finely arranged banks of palms and other ornamental plants. Mr. W. Wilshire, gardener to Mr. R. B. Angus, exhibited the largest bunch of grapes grown in this district; it was perfect, weighing 8 lb. 6oz.; variety, "Black-Barbarossa."

Altogether the show was a great success except financially, and the public did not patronize it as it deserved. However, one generous patron of all that is artistic and for the public good, the President of the Gardeners' and Florists' Club sent his check for $150.00.

It was the opinion of those who know that, comparing these exhibitions with those of New York and Boston, Montreal can hold her own with them.

Appended is a list of a few of the best varieties for bush culture.

YELLOW	WHITE
Golden wedding	Ivory
Georgina Pitcher	Niveus (rather, *Niveum*, as *Chrysanthemum* is of the neuter gender. Ed.)
Pitcher and Manda	The Queen
Yellow Queen	Enfant des deux mondes
PINK	Our Mutual Friend
Silver Cloud	CRIMSON G. W. Childs.
Mrs. Perrin	BRONZE Charles Davis.
Ermonhilda	
MAROON-RED J. A. Dirtell	

ALEX. GIBB, Montreal.

Sap.

Sap, its nature and use—How absorbed and assimilated; importance of cultivation to keep it pure and fit for conveying plant food.

At this season, when the sap will soon be again in action, a few remarks with reference to it may be appropriate.

Sap is the liquid which contains all the nourishment vegetables derive from the soil, and being absorbed by the fine roots or spongioles of the plant finds its way to its other extremity and develops the growth of buds and leaves.

Plants, unlike animals, have no mouth, and may seem, at first sight, incapable of receiving nourishment; and yet leaves and flowers are observed to be refreshed by air and moisture, therefore must be nourished by them, beside the process of feeding plants rooted in the earth, which evidently takes place by means of the roots. The absence of a mouth indicates that all the food plants receive must either be in the form of gas or liquid, and communicated by means of minute pores or *stomata*. In other words, digestion of the food has taken place before it is taken into the system of the plant, and thus its preparation as to fertilizing quality is rendered easy, in as much as manure properly fermented and prepared for application will at once assimilate with the crop and cause vigorous and healthy growth.

Theorists have found an analogy between the circulation of the sap in plants and the circulation of the blood in animals, but the analogy does not hold good. The motion of liquid within a plant is simply the ascent of the sap and the descent of the *cambium*, that is to say, the free ascent of the liquid in one form, and the descent of the same in another form after it has undergone a chemical change which renders it assimilable by the plant and thus builds up its structure and keeps it alive. Now, anything that will interfere with this process must have a bad effect upon growth and development:

bad soil or that which does not contain the necessary elements to constitute plant food, undrained land, in which the delicate spongioles, whose office it is to absorb the sap, in the first instance, perish; or in which various acids are generated by stagnant water, which instead of being nutritives are poisonous; lopping off branches at the wrong season, that is, either when there is not sufficient chemically changed sap returning to heal the wounds quickly, or when the sap is flowing so freely as to cause loss of vigor by its escape; destruction or loss of foliage which prevents the process of this chemical elaboration of the sap taking place to make it in the right condition to be used as nourishment.

The lesson to learn from a consideration of these facts is, obviously, that we must do all we can to keep the sap in a pure and healthy condition; 1st, by proper drainage and cultivation, 2nd, by applying such manure as we know will be essential to the growth of the tree or plant, 3rd, to do nothing which will interfere with its action, elaboration or assimilation.

There is certainly some analogy between the blood in animals and the sap in vegetables, both are their vital fluids, and the life and growth of either dep nd upon their purity.

G. MOORE.

Hardy Perennials.

Continued.

AQUILEGIA* (*Columbine*). *Natural Order Ranunculaceæ.

Aquilegia cœrulea

NATURAL ORDER.

A class quite indispensable to any flower-garden and adapted to ordinary garden soil. An elegant border plants, unrivalled for beauty of form and rich blending of color.

A. Canadensis. [Wild Honey suckle] 18 in., 6-7. Amer. Brilliant scarlet and yellow flowers. Very distinct.

A. chrysantha. Golden Spurred C.] 3 ft., 6-8. Colorado. Bright golden-yellow flowers with long thread-like spurs. Fragrant. One of the choicest. Elegant border plant.

A. cœrulea. [Rocky Mt. C.] 1 ft., 6-8. Rocky Mountains. Very large flowers, often four inches across, with deep-blue sepals and pure white petals and long recurved spurs. A grand species for the border or base of the rockery in well-drained loam.

A. glandulosa. [Altaian C.] 1 ft., 5-6. Siberia. Choice species with deep-blue sepals and pure white petals and very short spurs. An interesting and rare form.

A. vulgaris. 4 ft., 6-7. Eur. Flowers varying from pure white to blue, including combinations of these colors.

var. alba. [Munstead White C.] 2 ft., 5-7. Handsome broad light-green foliage and showy, dense-flowered heads of large pure white flowers. Very distinct and invaluable for cutting. One of the choicest flowers in our entire collection.

ARUNDO.—REED-GRASS.

Natural Order.

(*Gramineæ.*)

One of the noblest of the hardy ornamental grasses, thriving in rich soil, in well-drained situations, where with a good mulch of leaves in winter they will prove quite hardy. They all make noble specimens for single lawn planting, or can also be used with great effect with other hardy grasses, or in the border, or in connection with shrubs.

A. donax. 10 ft. Spain. Towering straight stems of the deepest green, clasped at regular intervals with broad-pointed foliage. Very effective.

var. vgta. Foliage beautifully variegated with stripes of silver and green.

Arundo donax variegata.

ASPHODELUS.—ASPHODEL.

(*Liliaceæ.*)

A vigorous plant, adapted to all soils, capable of very bold effects. The flowers are borne in dense spikes on many-branched flower stems. Choice for the border or rock garden.

A. abus. 2-3 ft. 6-7. Italy. Light-green foliage and tall spikes of pure white lily-like flowers. 25 cents.

A. ramosus. [King's Spear.] 3 ft., 5-6. Spain. Branching spikes of pure white flowers. 25 cents.

SEEDS.

Their nature, quality, hints for sowing.

The seed is the reproductive organ of all plants producing flowers and fruits; and, when we consider that the embryo monarch of the forest is locked up in a tiny kernel, we see how wonderful and interesting are the operations of nature: The size of the cone, nut or stone containing the germ is not always a criterion of the size to which the tree will grow; the cones and seeds of the giant trees of California are in no way proportionate to these stupendous objects of vegetation; many much smaller trees have very much larger seeds.

As the season for sowing approaches, we can, profitably, take a glance at a few particulars with regard to the subject.

First let us be sure that the seed we sow is of the purest and saved from varieties,

of whatever species, which have been well selected and approved ; experiments as to new kinds should be made at the experimental farms, and the astute farmer will keep himself informed as to results, to which he will adapt his practice. Then, let us assure ourselves that the seed has been properly ripened, harvested, and stored with a view to keeping it in good condition for quick germination when subjected to the necessary influences As no farmer can raise all the seed he requires, and beside which a frequent change is desirable, it will be seen that to deal with a good seedsman is of the utmost consequence ; there is no class of men in whose integrity the farmer has to place so much reliance as the seedsman ; the quality of the crop often depends upon the seed ; cheap seeds should be avoided : it is a mistake to risk the chance of obtaining a good crop for the sake of saving (?) a few dollars in the purchase of seeds.

Having made sure of procuring good seed, the next con ideration is the quality and condition of the soil in which it is to be sown ; this should be moist, not too wet or too dry, warm, mellowed by working with the spade or plough, rake, or harrow until it is in a smooth, soft, yielding state : If continual rains have made the soil too wet and adhesive, it is better to wait a few days until it has dried : or, if the soil is too dry and dusty it would be well to wait for a shower, although it would be less injurious to the crop to sow the seed in too dry than in too wet a seed bed.

It must be borne in mind that not only is germination dependent upon heat and moisture, but also upon air, and if this is excluded by the surface of the soil baking the particles of which it is composed adhering too closely to each other,or the seed being put into the ground too deeply, that is to say, below the atmospheric influence; either suspension of germination or premature decay will supervene. The depth at which seeds should be sown will depend upon their size, and on the hardness of the stone or shell which covers them ; Some flower seeds are so minute, as for instance, the *Calceolaria*, *portulacca*, etc., that they require scarcely any covering, but to be sown on the surface and merely shaded from intense light for a short time ; while others, as the acorn, chesnuts, and the like, must be sown at the depth of several inches to secure a proper degree of moisture varying with the nature of the soil. Some fruits ; as the Cherry Plum, and Peach, whose seed germs are protected by hard stones will, if deposited in the earth below the action of the air, remain intact for an indefinite period, and many weed-seeds, after having been buried deep in the ground for years, have germinated when brought near the surface by deep ploughing. (1) Germination cannot take place until the moisture has penetrated to the interior of the seed, and it will be adviseable, in case of those of which the outside covering is very hard, to soak them for a short time before sowing ; this will accelerate germination, which, in a crop of early vegetables for instance, is important.

As to thick and thin sowing, a great deal has been written and much controversy held, but the farmer must be guided by his own judgment and experience as to the quality and condition of the soil and the nature of the crop ; bearing in mind as a general rule, that good rich land will bear a crop with the seeds planted at greater distance apart than poor infertile soil. (2)

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(1) Hence the wild-mustard "cadluck" makes its appearance unexpectedly in some land.

(2) (In 1850, '51 and '52 we sowed 1 bushel of wheat to the acre, and the crops varied from 48 to 60 bushels an acre. The usual quantity sown by others in those days varied from 2 1/2 to 3 bushels.

ED.

Household Matters.

The Gift of Cooking.

Cooking, as a high art, can be learnt by professional training, but simple cooking for one's own household must be learnt by experience, there is no rule for such.

The professional cook has only to concentrate his mind on his dishes while his heart may sleep :

On the contrary, she who has to provide for a family has need of a strong, quick heart.

Her feelings must move in many directions ; she has to study the taste and distaste of her family, so that each taste shall be considered in turn.

The robust members cannot be treated as the delicate, old, or young.

What a pleasure it is to hear a few words of approval on the appearance of a new dish on the table for the first time ; how it gladdens the heart and cheers the spirits to know that her loving work has not been in vain. There can be no better greeting to long absent friends than to serve up a well remembered dish which they are known to like ; the smile of delight with which it is greeted with many words of praise and thanks to the kind heart, that has done its best to remind them that time has not obliterated her memory of long ago, well repays her for her trouble.

A badly cooked and untidily served dinner causes many a man to spend his evenings from home.

On the contrary, a well cooked and nicely served dinner makes a man feel contented with himself and his surroundings ; his pipe and book will do the rest ; and he is quite willing to spend his evening in the bosom of his family.

FOR THE CHILDREN

Golden Taffy

One cup of New Orleans molasses,
One of brown sugar,
One tablespoon of melted butter.
One tablespoon of vinegar.

Mix altogether boiled without stirring until it will harden when dropped into cold water.

When sufficiently boiled add one teaspoonful of baking powder. Beat well. Pour into buttered tins. As soon as cool enough to handle pull until a pretty golden color.

A most delightful occupation for children is making popped corn. To do this properly, the corn should be placed on an iron shovel or a fine wire one is much better for the purpose; hold the shovel over the bright flame till the corn is ready either to eat hot or to be made into a sweetmeat. If you desire to prepare it in the latter fashion, put into an iron saucepan three tablespoonfuls of water, one of butter, and a teacupful of white sugar. Boil these ingredients till they are ready to candy, throw in the popped corn and stir well so that every portion of the grain is well covered with the sugar. After this is done, remove the pan from the fire, and stir continously till cold. Then take out the corn, and allow it to harden. This quantity of syrup will coat three quarts of corn. Any sort of small nuts are nice prepared in this manner.

FOOD WASTED IN COOKING.

Life-Sustaining Value of Meat and Vegetables Lost Through Ignorance

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A series of investigations by experts connected with the United States department of agriculture go to show that there is an immense amount of popular ignorance in the matter of cooking ; that, while the greater part of the food of man is prepared for use by

cooking, yet the changes which various foods undergo during the process and the losses which are brought about have been but little studied. Few persons know, for instance, that in a hundred pounds of uncooked cabbage there are but 7 1/2 pounds of dry matter, and of this dry matter from 2 1/4 to 3 pounds are lost in the cooking pot. Experiments with potatoes showed that in order to obtain the highest food value potatoes should not be peeled before cooking, that when potatoes are peeled before cooking the least loss is sustained by putting them directly into hot water and boiling as rapidly as possible. Even then the loss is very considerable.

If potatoes are peeled and soaked in cold water before boiling, the loss of nutrients is very great, being one-fourth of all the albuminoid matter. In a bushel of potatoes the loss would be equivalent to a pound of sirloin steak. Carrots contain less nitrogen, but relatively more albuminoid nitrogen than potatoes, and therefore furnish more matter available for building muscular tissues. In order to preserve the greatest amount of nutrients in the cooking of carrots, the pieces should be large rather than small. The boiling should be rapid, so than the food value of the vegetable shall not be impaired, as little water as possible should be used, and if the matter extracted is made available as food along with the carrots a loss of 20 to 30 per cent or even more of the total food value may be prevented. In the cooking of cabbage the kind of water used has more effect on the loss of nutrients than the temperature of the water at which the cooking is started. In any case the loss is large. The losses which occur in the cooking of potatoes, carrots and cabbages vary with the different methods of boiling followed.—Pittsburg Dispatch.

STEWS

First and foremost in economical cookery comes the stew. Now, as you all know, there are stews and stews. Some people seem to imagine that tough, gristly pieces of meat swimming in greasy water constitutes a stew. Small wonder is it therefore, that many people shudder and turn up their noses at the very mention of the stew. To make a good family dinner, commend me to a piece of shin of beef, stewed in an earthen jar; this can either be put in a corner of the oven or set in a saucepan of water. If cooked in this manner, and a long time allowed for the process, I venture to say, you will have a tender, nourishing dinner, far better, in fact, than the finest steak cooked in a hurry. This stew can be thickened at first, as the flour cannot sink to the bottom and burn as when cooked in an ordinary saucepan; add a few vegetables and spices to your meat, and let it stew slowly at least four hours. The addition of a few forcemeat balls will make this stew nearly equal to hare, especially if served with red currant jelly. Stewed liver cooked exactly like the beef also makes a savoury dish, going much farther than when fried. A few suet dumplings added to the stew is a great improvement.

APPLE CHARLOTTE

The old fashioned Apple Charlotte is about as acceptable to the general palate as anything made of apples, especially with its many "improvements," and served with cream. Pare and slice twelve tart apples; cut up stale bread into dice, a quart bowlful. Now put several bits of butter into a pudding dish, then a layer of the sliced apples, then of the bread crumbs, a pinch of salt, butter and ground cinnamon and sugar, all added liberally. Repeat the order of ingredients till the dish is very full—as they settle down in cooking—having apples and spice on the top. Use one and a half cup of sugar and a generous half cup of butter altogether. Now over all pour a coffee cup of boiling water. Cover with a plate and bake in a moderate oven a full hour. When about half done remove the plate with a spoon, press down the apples, sift sugar over them, return to the oven, and cook till done. It needs close watching, but well repays the trouble. The bread seems turned to jelly, and the pudding is of a deep red color. It is good hot or cold, and with cream or without.

Another apple pudding is made in this way; Make a batter of two eggs, one pint of milk, one teaspoonful of baking powder, and flour enough to make a stiff batter. Fill earthen cups, alternating this mixture with chopped tart apples. Steam one hour and serve hot, with sweetened whipped cream. HOUSEKEEPER.

The Horse.

RULE BY KINDNESS AND HUMANITY.

There is no vice more detestable in man than cruelty in any form to any being. The crime is sometimes punished but seldom does it meet with adequate retribution. The man who mercilessly uses his power to punish any creature under his control is a disgrace to his kind, yet how many of these whom "each kindred brute might bid blush for shame," there are in the world. There is no animal having equal claims upon our consideration and kindness with the horse, yet none suffer so greatly as this animal from human persecutions and wrongs of every degree.

To the honor of our kind be it said, that perhaps in the majority of cases where our horses are ill-used, it is more through thoughtlessness than through willful cruelty. But this does not make it any the less an outrage against our first best servant and friend, and it is as much the duty of true horsemen to point out where ignorance is responsible for ill-usage as to prevent intentional cruelty.

One of the most lamentable things in life is to see a young colt being "broken" by an *ignorant* and *incompetent* "breaker." His ignorance is excusable if he is kind, but your average breaker does not believe in the power of "moral suasion" in the equine kingdom. His motto is, "I'll break his spirit or I'll break his heart;" and by doing one, he accomplishes the other. The ordinary colt "breaker" is a colt killer, and he must give way to the colt educator. A successful educator needs unlimited patience, a sweet temper and a good stock of ingenuity and tact. The happy mixture of patience and firmness that will not be mastered by the horse, but will master him without harshness, is the kind of nature which copes successfully with a wild and foolish colt, whose wildness and foolishness are merely exuberance of spirit "unballasted" by education. A horse educator must be a thinker. Every teacher of the human "young idea" knows that a pupil who appears extremely dull in learning a task the utility or purpose of which he does not comprehend, may be surprisingly bright when he is made to understand *why* he is learning it, and of what advantage it will be.

To teach a thinking being successfully, we must have consideration and regard for his thoughts, and for the effect of our methods upon his mental development—and the trainer, who forgets that the high-bred horse is possessed of a high order of mentality, of an exceedingly retentive memory, and a keenly sensitive nature, will fail as an educator. To teach a colt what is right and what is wrong is equally difficult, and the only means of doing so is to convey to him a sense of displeasure — not anger — at wrong-doing, and of warm approval when he does well. The great mistake of the ordinary trainer is his faith in terrorizing the animal to do right, instead of teaching him. A state of fear renders learning impossible.

The animal must be made to understand that you are his friend and that no harm will come to him unless by reason of his own vice. While improper actions should be promptly restrained, it should not be forgotten that horses, like men, make honest mistakes, go wrong unintentionally, misunderstand orders, and punishment for this is wrong.

But a little patience and perseverance will always succeed. Gentle punishment will teach the animal that certain things are wrong, and when once he knows what he is wanted to do, and that his doing it will meet with kind approval, a horse of average intelligence will prove an apt pupil in further lessons.

The most trying horses to the temper are balky ones, yet it is probable there never

was a natural balker. Balky horses are made not born so. Overloading and discouragement are, in a majority of cases, the cause of trouble.

Men assign horses to perform tasks for which they are not calculated. Spirited, nervy little bits of condensed pluck and courage are hooked double, with dull, steady, plodding work-horses, and are jerked and curbed in senseless efforts to make them conform to the slow and spiritless gait of their draft companions. As well try to manacle the wind! A horse should not be put to uses for which he is not suited. How often we see a horse, whose place is in the shafts of a carriage, or at the lightest of draft work, hitched up to a heavy load. He makes quick, gritty, spasmodic efforts to draw, and soon becomes discouraged. Then, by way of encouragement, he is often whipped, pounded with a heavy stick, and even in some instances kicked while, if the driver had not eminently good qualifications for entrance to a lunatic asylum, he would reflect, that the horse cannot know whether he is punished for failing to draw or for making the attempt. And to witness this too frequent spectacle, of a horse anchored to a load and whipped, beaten, and kicked, makes the blood in a true man's veins seethe and boil, and he longs just for a little while to occupy a seat of judgement. The importance of a right beginning cannot be overrated, for a well trained horse is not often ill-used. Those who have had the misfortune to have been badly "broken" are the ill-starred individuals in the horse world. For faults for which their early teacher was responsible they are whipped, kicked, and pounded through life, "old" and broken down, while yet they should be in their prime, and left at last to die of neglect and starvation—this is the outline of many a good horse's hard life. An ounce of humanity in the beginning may save many a pound of pain in the future; hence the importance of humane and rational education of colts.

Few creatures possess in a greater degree the virtues of gratitude and natural kindness than the horse. He is slow to forgive an injury, but never forgets continued kindness. How often every thoughtful horseman, has observed touching evidence of the friendship of his horse. The gently caressing nose, the kindly eye, the neigh of welcome, and the outstretched neck, speak as eloquently as words, of a noble, thinking nature. Yet this same animal can, by ill usage, be transformed into a vicious, dangerous brute.

Finally, it is a good thing for a man to be master of his horse, but to be master of his horse's affection is an absolutely noble thing.

W. R. GILBERT.

If Mr. Henry Bergh, the philanthropist who has done so much for man's most useful servitor, the horse, has not the following suspended from the walls of the office of the society, he here has the means of rectifying the omission. It was written by a resident of New York in 1777, and placed over the resting-place of

MY POOR OLD HORSE.

When past my prime, wounded, lame, and poor,
My ingrate master drove me from his door;
Forgetting all my toils and earnings past,
To perish on a ruthless world I then was cast.

My worn-down teeth through a long summer day
Did seldom mumble one poor lock of hay;
Fixed to a spot, my limbs would scarce sustain—
A meagre corpse, through which my ribs complained.

So weak I was that while the hungry flies
In clusters fastened on my nose and eyes,
Their tortures undisturbed I must bear,
For I couldn't move a joint or whisk a hair.

Abandoned in the street, the stroke I waited
Which should release me from a world I hated.
Welcome, old death, old horses last, best friend—
My master's woes *begin* where mine shall *end*.

In pastures green I shall forever dwell,
While *cruelty* sinks to its native hell.